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THE  
QUEENSLAND FLORA:

BY  
F. MANSON BAILEY, F.L.S.,  
COLONIAL BOTANIST OF QUEENSLAND.

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

PART IV

*HYGROPHYLLACEÆ TO ELÆAGNACEÆ*

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NEW YORK  
BOTANICAL  
GARDEN.



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# THE QUEENSLAND FLORA.

## CLASS I. DICOTYLEDONS.

### SUBCLASS II. GAMOPETALÆ or MONOPETALÆ.

#### SERIES III. BICARPELLATÆ (continued).

**Alliance VIII. Polemoniales.**—*Corolla regular. Stamens as many as corolla-lobes. Leaves most frequently alternate.*

LXXXIII. HYDROPHYLLACEÆ. Herbs or rarely undershrubs. Leaves alternate or the lower ones opposite. Flowers regular in unilateral racemes or cymes. Stamens as many as corolla-lobes and alternate with them. Anthers free. Ovary 1-celled, with 2 parietal placentas or rarely 2-celled. Styles or style-branches 2. Fruit a capsule. Seeds albuminous.

LXXXIV. BORAGINÆÆ. Herbs usually coarsely hirsute or, in drupaceous genera, trees or shrubs. Leaves mostly alternate. Flowers regular in cymes or unilateral racemes. Stamens as many as corolla-lobes and alternate with them, or very rarely fewer. Ovary 2 or 4-celled with 1 ovule in each cell, or 2-celled with 2 parallel ovules in each cell. Style single, entire or forked. Fruit a drupe, or dry and separating into 2 or 4 nuts. Seeds with little or no albumen.

LXXXV. CONVULVACEÆ. Twiners, or rarely erect herbs shrubs or trees. Leaves alternate. Flowers regular, usually axillary. Corolla-limb folded in the bud. Stamens 5, alternate with the corolla-lobes or angles. Ovary of 2 to 4 cells or carpels, with 1 or 2 erect ovules in each. Style single and entire, or 2 branched or 2 distinct styles. Fruit capsular or succulent and indehiscent. Seeds with little or no albumen. *Cotyledons very much folded* (or inconspicuous in *Cuscuta*).

LXXXVI. SOLANACEÆ. Herbs or soft-wooded trees. Leaves alternate. Flowers regular or nearly so. Corolla-lobes folded, or rarely imbricate in the bud. Stamens as many as corolla-lobes and alternate with them. Ovary 2-celled or spuriously 4-celled (rarely 3 or 4-celled), with several ovules in each cell. Style single. Fruit a berry or a capsule. Seeds albuminous, the embryo usually curved or annular.

**Alliance IX. Personales.**—*Corolla frequently irregular or oblique. The fifth stamen less than the rest, or often abortive or wholly wanting. Carpels of ovary many-ovulate or superposed 2-ovulate.*

LXXXVII. SCROPHULARINÆÆ. Herbs, or rarely shrubs or small trees. Leaves alternate or opposite. Flowers irregular, with the corolla-lobes bilabiate or imbricate in the bud or rarely nearly regular with the corolla-lobes folded. Perfect stamens 4 in pairs or 2, the fifth rudimentary or wanting or very rarely perfect. Ovary 2-celled, with several ovules in each cell. Fruit a capsule or very rarely a berry. Seeds albuminous; embryo usually straight.

LXXXVIII. LENTIBULARIÆÆ. Herbs, either aquatic with floating capillary-divided leaves or terrestrial with radical or without any leaves. Flowers irregular, the corolla 2-lipped. Stamens 2; anthers 1-celled. Ovary 1-celled, with peltate ovules inserted on a free central placenta. Fruit a capsule. Seeds small, without albumen.

LXXXIX. OROBANCHACEÆ. Leafless herbs, not green, parasites on roots. Flowers irregular. Stamens 4, in pairs; anthers 2-celled. Ovary 1-celled, with 2 or 4 parietal placentas and very numerous ovules. Fruit capsular. Seeds albuminous

XC. GESNERACEÆ. Herbs or, when shrubby, often epiphytical or climbing, rarely erect shrubs. Leaves opposite. Flowers usually irregular. Perfect stamens 4 in pairs, or rarely 2 only. Ovary 1-celled, with 2 parietal placentas and numerous ovules. Fruit a berry or capsule. Seeds with or without albumen.

XCI. BIGNONIACEÆ. Woody climbers, trees or shrubs. Leaves opposite, often compound. Flowers irregular. Perfect stamens 4 in pairs, or 2 only. Ovary 2-celled, with 2 distinct and sometimes distant placentas on the dissepiment in each cell; ovules usually numerous. Fruit a capsule, usually long and narrow. Seeds winged, without albumen.

XCII. PEDALINEÆ. Herbs. Leaves opposite. Flowers irregular. Perfect stamens 4, in pairs, or rarely 2 only. Ovary composed of 2 rarely 3 or 4 carpels, but divided (at least after flowering) into twice as many cells by spurious dissepiments. Ovules 2 or more, or rarely 1 only in each spurious cell (half-cell). Fruit hard and indehiscent or capsular. Seeds without albumen.

XCIII. ACANTHACEÆ. Herbs or shrubs, rarely twiners. Leaves opposite. Flowers more or less irregular. Perfect stamens 4 in pairs, or 2 only. Ovary 2-celled, with 2 or more superposed ovules in each cell. Fruit a capsule opening elastically in 2 valves. Seeds without albumen, usually subtended by hooked or rarely cup-shaped or minute retinacula.

**Alliance X. Lamiales.**—*Corolla frequently irregular or oblique. The fifth stamen less than the rest, or often abortive or wholly wanting. Ovary of 1-ovulate carpels, or ovules 2, collateral.*

XCIV. MYOPORINEÆ. Shrubs or small trees. Leaves alternate. Stamens usually 4, in pairs; anthers when open reniform and 1-celled by confluence. Ovary not lobed, the style terminal. Micropyle and radicle superior.

XCV. VERBENACEÆ. Herbs shrubs or trees. Leaves opposite or rarely alternate. Stamens 2 or 4, in pairs, or rarely equal and isomerous with the corolla-lobes; anthers 2-celled. Ovary not at all or scarcely lobed, the style terminal. Micropyle and radicle inferior.

XCVI. LABIATÆ. Herbs or shrubs. Leaves opposite. Stamens 2 or 4, in pairs; anthers 2-celled or 1-celled by abortion or by confluence. Ovary deeply lobed, the style nearly basal between the lobes. Micropyle and radicle inferior.

#### [ANOMALOUS ORDER.]

XCVII. PLANTAGINEÆ. Herbs. Leaves radical or tufted, rarely scattered. Flowers regular, the corolla with 4 spreading scarious lobes. Stamens 4 or fewer, equal; anthers 2 celled. Ovary not lobed, with a terminal style. Seeds peltate.

### SUBCLASS III. MONOCHLAMYDEÆ.

Perianth really or apparently simple, the lobes or segments all calycine or herbaceous, or all petal-like or scarious, or entirely wanting (rarely petals or petal-like staminodia in a few *Euphorbiaceæ* or *Phytolaccaceæ*).

SERIES I. CURVEMBRYEÆ.—Seeds with often a farinaceous albumen; embryo curved excentric lateral or peripheric, rarely somewhat straight subcentric and narrow. Ovule 1 in the ovary or in each carpel or, in a few *Amarantaceæ*, more erect in the centre of the cell. Flowers hermaphrodite or, in a few genera, unisexual or polygamous. Petals very rare. Stamens the same number as lobes of perianth or less, rarely more.

XCVIII. NYCTAGINÆ. Herbs shrubs or trees. Leaves usually opposite, without stipules. Lower portion of the perianth persistent and enclosing the ovary and fruit, the upper portion deciduous or withering. Ovary 1-celled, with 1 ovule and an undivided style.

XCIX. ILLECEBRACEÆ. Perianth herbaceous or margins scarious, persistent. Stamens perigynous. Ovary 1-celled. Style-branches or styles 2 to 3. Herbs, rarely shrubs. Leaves generally opposite. Stipules scarious.

C. AMARANTACEÆ. Perianth never herbaceous, bracts and bracteoles 2-stipitate. Stamens hypogynous or perigynous; filaments connate at the base. Ovary 1-celled; style simple or 2 to 3-fid. Utricle indehiscent or irregularly ruptured or circumscissile. Herbs or undershrubs. Leaves opposite or alternate, without stipules.

CI. CHENOPODIACEÆ. Herbs or shrubs, often succulent or scaly-tomentose. Leaves alternate or rarely opposite, without stipules. Perianth usually herbaceous. Ovary (of 2 or 3 carpels) 1-celled, with 2 or 3 styles or style-branches and only 1 ovule.

CH. PHYTOLACCACEÆ. Herbs shrubs or trees. Leaves alternate without stipules. Ovules 1 in each carpel.

CIII. POLYGONACEÆ. Herbs or shrubs. Leaves alternate, stipules usually thin or scarious forming a sheath or ring round the stem. Ovary (of 2 or 3 carpels) 1-celled, with 2 or 3 styles or style-branches and only 1 ovule.

SERIES II. MULTIOVULATÆ AQUATICÆ.—Immersed herbs. Ovary a syncarp, each cell or placenta with numerous ovules.

CIV. PODOSTEMACEÆ. Herbs with thalliform or cauliform base, adhering to inundated rocks. Leaves or fronds, bryoid or algaform. Perianth small thin or wanting. Stamens various. Ovary superior, cells or placentas 2 to 3. Seeds exalbuminous.

SERIES III. MULTIOVULATÆ TERRESTRES.—Herbs or shrubs. Ovary a syncarp, each cell or placenta with numerous ovules.

CV. NEPENTHACEÆ. Flowers diœcious. Ovary superior, 3 or 4-celled, with many ovules in each cell. Seeds albuminous. Shrubs often scandent. Leaves terminating in pitchers.

CVI. ARISTOLOCHIACEÆ. Flowers hermaphrodite. Perianth with an oblique or valvately lobed limb. Stamens round the base of the style. Ovary inferior, 3 to 6-celled, with several ovules in each cell. Seeds albuminous. Herbs or climbers.

SERIES IV. MICREMBRYÆ.—Ovary a syncarp monocarp or apocarp; ovules in each carpel solitary or rarely 2 or few. Seeds with copious fleshy albumen or (in *Piperaceæ*) farinaceous; embryo very small, very rarely (in a few *Monimiaceæ*) bigger.

CVII. PIPERACEÆ. Perianth none besides small bracts. Bract 1 under each flower. Flowers in spikes racemes or heads, hermaphrodite or unisexual. Herbs shrubs or trees, with articulate branches and flat leaves.

CVIII. MYRISTICÆÆ. Trees. Leaves alternate. Flowers diœcious. Perianth-lobes 1-seriate, valvate. Stamens united in a central column. Carpel 1. Embryo very small at the base of a ruminant albumen.

CIX. MONIMIACEÆ. Trees or shrubs. Leaves opposite. Perianth-lobes in 2 or more rows. Stamens opposite the perianth-lobes or indefinite. Carpels usually several. Embryo very small, in a fleshy albumen.

SERIES V. DAPHNALES.—Ovary a monocarp, very rarely a syncarp; cells 2 to 4; ovules in ovary or each cell solitary or 2 collateral, very rarely a few superposed. Trees or shrubs very rarely herbs. Flowers often hermaphrodite. Perfect perianth often calycine, lobes 1 to 2-seriate. Stamens perigynous, of equal number to the lobes or sometimes fewer.

CX. LAURINEÆ. Trees or shrubs with alternate or rarely opposite leaves or (in *Cassytha*) leafless parasitical twiners. Perianth-segments usually in 2 rows. Stamens opposite the perianth-segments; anther-cells opening in deciduous valves. Carpel 1. Fruit succulent. Albumen none. Radicle superior.

CXI. PROTEACEÆ. Trees or shrubs rarely undershrubs. Leaves alternate or rarely opposite. Perianth-segments 4, valvate. Stamens opposite the perianth-segments and inserted on them. Carpel 1. Albumen none. Radicle inferior.

CXII. THYMELÆACEÆ. Shrubs trees or rarely herbs, with a stringy bark. Flowers hermaphrodite or rarely diœcious. Ovary free but enclosed within the base of the perianth, 1 rarely 2-celled, with 1 ovule in each cell. Ovule pendulous.

CXIII. ELEGNACEÆ. Trees or shrubs, sometimes climbing; the indumentum consisting of stellate or peltate scales. Flowers hermaphrodite or diœcious. Ovary 1-celled, with 1 erect anatropous ovule.

## ORDER LXXXIII. HYDROPHYLLACEÆ.

(Hydrophyllaceæ and Hydroleaceæ, D.C.)

Flowers regular. Calyx free, of 5 divisions. Corolla with a short or rarely elongated tube, and 5 spreading lobes, imbricate and sometimes contorted in the bud. Stamens 5, inserted at the base of the corolla-tube and alternating with its lobes; anthers 2-celled, the cells opening in longitudinal slits. Ovary superior, entire, either 1-celled with two parietal or free placentas or rarely 2-celled with the placentas on the dissepiment; style terminal, bifid or divided to the base into 2 distinct styles; stigmas obtuse or capitate; ovules numerous or rarely reduced to 2 to each placenta and then laterally attached. Fruit a capsule, opening in 2 valves, the margins alternating with the placentas or rarely opposite the dissepiment. Seeds with a thin usually reticulate testa, and copious fleshy albumen. Embryo straight, usually small and distant from the hilum.—Herbs or rarely undershrubs, often hispid. Leaves alternate or rarely the lower ones opposite, entire lobed or divided. Flowers usually blue or white, in one-sided spikes or racemes, often rolled back when young and sometimes branching into dichotomous cymes, as in *Boraginæ*, or forming small and compact cymes or clusters. Bracts usually present under the pedicels and often leaf-like; bracteoles rarely present.

A small Order, chiefly American. The only Australian genus is also American, but extends into tropical Asia and Africa, and differs from the remainder of the Order in its completely 2-celled ovary and capsule, and in the septifragal dehiscence of the latter.—*Benth.*

## 1. HYDROLEA, Linn.

(From *hydor*, water, and *elaia*, oil; alluding to the habitat and nature of the plants.)

Calyx divided nearly to the base. Corolla almost rotate, with a very short tube. Ovary 2-celled, with very numerous ovules in each cell on a broad spongy placenta attached along the central line to the dissepiment. Styles 2. Capsule opening in 2 valves parallel to the dissepiment.—Herbs or undershrubs. Leaves entire. Flowers blue, usually in short and compact racemes or cymes.

A genus of few species, all apparently American, including the 2 Australian ones.

Annual, glabrous or nearly so, without spines . . . . . 1. *H. zeylanica*.  
Perennial, glandular-pubescent and hirsute, armed with axillary spines . . . 2. *H. spinosa*.

1. ***H. zeylanica*** (a Ceylon plant), *Vahl*; *Chois. in DC. Prod.* x. 180; *Benth. Fl. Austr.* iv. 382. Said to be always annual, but the stems creep and root at the base often to a considerable length, ascending to about 1ft., the whole plant quite glabrous or the inflorescence and calyxes hispid with a few hairs. Leaves lanceolate, entire, narrowed at the base and sometimes shortly petiolate, mostly  $1\frac{1}{2}$  to  $2\frac{1}{2}$ in. long. Flowers in rather compact simple or branched racemes or cymes in the upper axils, usually shorter than the leaves or the upper ones forming a terminal panicle. Bracts small and narrow. Calyx-segments lanceolate, striate, about 3 lines long. Corolla scarcely exceeding the calyx, divided to about the middle into broad lobes. Stamens and styles shorter than the corolla; anthers sagittate. Capsule membranous, shorter than the calyx. Seeds very small and numerous.—*Comp. Bot. Mag.* ii. 193 t. 26; *Wight, Ill. t.* 167; *lc. Pl. t.* 601; *Rheede, Hort. Mal.* x. 28.

Hab.: Gulf of Carpentaria, *F. v. Mueller*.

Abundant in tropical Asia and Africa, less so in tropical America

2. ***H. spinosa*** (plant spiny), *Linn.*; *Chois. in DC. Prod.* x. 181; *Benth. Fl. Austr.* iv. 383. An erect perennial or undershrub of 1 to 2ft., glandular-pubescent and hispid with spreading hairs, more or less viscid and armed with axillary spreading spines of  $\frac{1}{4}$  to  $\frac{1}{2}$ in. Leaves lanceolate or ovate-lanceolate,

acnte, contracted into a short petiole, from under 1in. to about 2in. long. Flowers larger than in *H. zeylanica*, in compact leafy cymes terminating the stems and upper branchlets. Calyx-segments narrow-lanceolate, acuminate, above 3 lines long. Corolla exceeding the calyx, divided to about the middle into broad lobes. Stamens and styles rather long; anthers lobed at both ends. Ovary, capsule, and seeds of *H. zeylanica*.—Bot. Reg. t. 566.

Hab.: Cape York, *Damel*.

Very abundant in tropical America.

## ORDER LXXXIV. BORAGINEÆ.

Flowers regular or nearly so. Calyx free, of 5 rarely 4 or 6 or more divisions or teeth or rarely irregularly split. Corolla with a long or short tube, and 5 rarely 4 or 6 or more lobes, imbricate or induplicate in the bud. Stamens as many as corolla-lobes or very rarely fewer, inserted in the corolla-tube and alternate with its lobes; anthers 2-celled, the cells opening in longitudinal slits or rarely in terminal pores. Ovary superior, entire or 4-lobed rarely 2-lobed, either 4 or 2-celled with 1 ovule in each cell or 2-celled with 2 ovules in each cell (in all cases formed of 2 carpels); style terminal or inserted between the lobes; ovules laterally attached, ascending or pendulous. Fruit either a drupe with the endocarp entire or separating into 2 carpels or 4 pyrenes, or dry and separating into 4 rarely 2 nuts. Seed with a thin testa; albumen none or scanty; embryo straight; cotyledons flat and rather thick or rarely folded; radicle short.—Herbs, usually rough with coarse hairs, or in the drupaceous genera sometimes trees or shrubs with a softer indumentum or glabrous. Leaves alternate or very rarely opposite, usually undivided, entire or toothed, very rarely deeply lobed. Flowers in one-sided spikes or racemes, rolled back when young and often forked or dichotomous or rarely in irregularly-branched panicles or solitary. Bracts often not immediately subtending the pedicels and sometimes entirely wanting; bracteoles very rarely present.

A considerable Order, the herbaceous genera chiefly spread over the northern hemisphere with a very few tropical or southern species; the frutescent drupaceous genera chiefly tropical in the New as well as the Old World.

TRIBE I. **Cordiææ**.—Trees or shrubs. Style terminal on the entire ovary, twice bipartite. Drupe 4—1-seeded; albumen none; cotyledons plicate longitudinally.

Calyx-teeth very short, irregular . . . . . 1. **CORDIA**.

TRIBE II. **Ehretieæ**.—Style terminal on the entire ovary, simple, bipartite or styles 2. Drupe with 2 2-celled or 4 1-celled pyrenes, or of 4—1 nuts.

Trees or shrubs. Style 2-fid . . . . . 2. **EHRETIA**.

Prostrate herbs. Styles 2 . . . . . 3. **COLDENIA**.

Style simple, filiform. Fruit separable into 2 2-celled carpels. Anther-points straight . . . . . 4. **HALGANIA**.

TRIBE III. **Heliotropieæ**.—Style terminal on the entire ovary, depressed-conic at the apex, or with a horizontal ring below the stigmas. Fruit as of Ehretieæ.

Shrubs, often scandent. Style short, shortly 2-lobed . . . . . 5. **TOURNEFORTIA**.

Herbs. Style dilated at the apex or above the base . . . . . 6. **HELIOTROPIS**.

TRIBE IV. **Borageæ**.—Herbs. Style simple or biid, rising from between the ovary-lobes (except in *Trichodesma*). Nuts 4, rarely 3—1 by suppression. Albumen none.

SUBTRIBE I. **Cynoglosseæ**.—Nuts attached to a convex or conical carpophore, scar continued to the apex of the nuts which are often depressed, produced, or saccate at the base.

\*Fruiting-calyx enlarged, enclosing the nuts.

Anthers conically connivent, lanceolate, subexserted . . . . . 7. **TRICHODESMA**.

\*\*Nuts depressed, their bases produced downwards.

Stamens included. Nuts obovoid, glochidiate . . . . . 8. **CYNOGLOSSUM**.

\*\*\*Nuts connate, forming a pyramidal fruit, margined, hardly produced downwards.

Racemes bracteate. Margins of the nuts glochidiate, scarcely reflexed . . . . . 9. **ECHINOSPERMUM**.

SUBTRIBE II. **Eritrichiææ**.—Nuts attached to a convex or conical carpophore, scar in the middle or lower half of the nuts which are not depressed at the base but are produced at the apex above the scar, free round the base of the style.

\*Scar in the basal half of the nut.

Racemes ebracteate. Nuts 4 . . . . . 10. ERITRICHIMUM.  
Racemes bracteate. Nuts 2, 1-seeded . . . . . 11. ROCHELIA.

SUBTRIBE III. **Lithospermeæ**.—Nuts on a flat or nearly flat receptacle; scar basal, but little hollowed out, without a prominent margin

\*Racemes ebracteate. Corolla-lobes distinct.

Corolla-tube short. Nuts ovoid-oblong . . . . . 12. MYOSOTIS.

\*\*Racemes bracteate. Corolla-lobes distinct.

Corolla-throat naked or with small scales . . . . . 13 LITHOSPERMUM

## 1. **CORDIA**, Linn.

(After E. Cordus.)

Calyx tubular or campanulate, 5-toothed or irregularly toothed or lobed. Corolla-tube cylindrical or funnel-shaped, the limb 5 or sometimes 6 or more lobed. Stamens inserted in the tube; anthers included or exserted. Ovary entire, 4-celled, with 1 pendulous ovule in each cell; style terminal, twice forked. Fruit a drupe, the endocarp hard, with 4 cells or fewer by abortion. Seeds without albumen; testa thin; cotyledons longitudinally folded; radicle superior.—Trees or shrubs, glabrous scabrous-pubescent or villous. Leaves entire or toothed. Flowers in cymes, sometimes contracted into heads, at first terminal, but often becoming lateral by the growth of the branch. Bracts small or none.

A considerable genus, spread over the tropical regions of both the New and the Old World.

SECT. I. **Myxa**.—Corolla small, white tube not exceeding the calyx.

Drupe sealed on the open calyx.

Usually villous. Calyx cylindrical, strongly-ribbed . . . . . 1. *C. aspera*.

Glabrous or scabrous. Calyx campanulate, smooth . . . . . 2. *C. Myxa*.

SECT. II. **Sebesten**.—Corolla larger, orange, tube exceeding the calyx.

Drupe enveloped in the enlarged calyx. Calyx tubular. Corolla broadly funnel-shaped . . . . . 3. *C. subcordata*.

1. **C. aspera** (rough). *Forst. Prod.* 18; *Benth. Fl. Austr.* iv. 386. A tree of 20 to 30 ft., the young shoots rusty-pubescent or villous. Leaves petiolate, ovate, acuminate with the point sometimes much elongated, irregularly toothed or rarely entire, membranous, sprinkled above with short scattered hairs, the veins underneath scabrous pubescent or hirsute. 3 to 6 in. long in some specimens, twice as large in others. Flowers small, in shortly pedunculate, rather dense cymes. Calyx scarcely above 2 lines long, tubular, hirsute, with 10 or 12 prominent ribs and 5 or 6 small linear teeth. Corolla-tube cylindrical, scarcely so long as the calyx; lobes ovate, undulate and crisped, much shorter than the tube. Stamens scarcely exserted; anthers small. Style forked, with spatulate shortly 2-lobed branches. Drupe whitish, ovoid-pyramidal, not exceeding  $\frac{1}{2}$  in. and sometimes much smaller, resting on the broad open calyx; putamen hard, very rugose, ripening usually on a single seed.—*DC. Prod.* ix. 499; *Seem. Fl. Vit.* 169 t. 35; *F. v. M. Fragm.* vi. 114.

Hab.: Rockingham Bay, *Dallachy*, and other tropical localities.

The species is also in the islands of the South Pacific.

Wood of a light colour, light and soft. —*Bailey's Cat. Ql. Woods* No. 286a.

Var. *inciso-dentata*. Leaves (all young in the specimens seen) irregularly and deeply toothed, almost lobed, but the teeth perhaps not so prominent in the adult state.—*C. laevata*, *F. v. M. Fragm.* v. 193.—Cape York, *Diemel*.

2. **C. Myxa** (juice of fruit viscid), *Linnaeus*: *DC. Prod.* ix. 179; *Benth. Fl. Austr.* iv. 386. Sebastian Tree (or, according to Dr. Dymock, "Sapistán," which he says is an abbreviation of "Sag-pistán," which means in Persian "dogs' dogs"); "Bpa Burry," Forest Hill, *Macartney*. A handsome tree, with a dense coma, glabrous or the foliage scabrous-pubescent. Leaves on rather long petioles, from ovate to orbicular, very obtuse or shortly acuminate, entire or irregularly sinuate, 3 or 5-nerved at the base, usually 2 to 3 in. long. Flowers not large, polygamous, in loose pedunculate cymes or panicles. Calyx membranous, about 3 lines long, entire and closed over the corolla in the bud, opening irregularly into short lobes without prominent ribs when the flower expands, hardened, broadly cup-shaped, and irregularly and broadly toothed or lobed under the fruit. Corolla-tube oblong-cylindrical, slightly contracted at the throat, nearly as long as the calyx, glabrous inside and out; lobes narrow, recurved, as long as the tube. Stamens exserted, but not exceeding the corolla-lobes; anthers oblong-linear. Style short, with 4 long filiform branches stigmatic along the inner side. Drupe ovoid or nearly globular, pale yellow or slightly pink, the pulp very viscid, the putamen very hard, usually 1 or 2-celled, with 1 seed in each cell.—*Wight. Illustr.* t. 169; *C. dichotoma*, *Forst.*; *R. Br. Prod.* 498; *C. Brownii*, *DC. Prod.* ix. 499; *C. latifolia*, *Roxb.*; *DC. Prod.* ix. 478; *C. triocarpa*, *F. v. M. Fragm.* i. 59; *Sebestena officinalis*, *Gertn. Fruct.* i. 364 t. 76; *Beurria globra*, *G. Don. Gen. Syst.* iv. 290; *Rheede. Hort. Mal.* iv. t. 37.

Hab.: Broadsound, *R. Brown*; E. coast, *A. Cunningham*; Gilbert River, *F. v. Mueller*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*; Nerkool Creek, *Bourman*; Rockhampton, *Thozet, Dallachy*.

The specimens with all the flowers male have usually a looser, more slender inflorescence than those in which all or nearly all the flowers are perfect. The species is dispersed over tropical Asia, from Ceylon to the Philippines, and is also sent from tropical Africa, but in many places it is cultivated only.—*Benth.*

In India the wood is considered fairly strong, and is used for boat-building, well-curbs, gun-stocks, and canoes; the bark for rope-making, and the fruit for eating. Medicinally the dried fruit is valued on account of its mucilaginous nature and demulcent properties; it is much used in coughs and chest affections, also in irritation of the urinary passages; in larger quantities it is given in bilious affections as a laxative.—*Dymock. Veg. Mat. Med. of W. Ind.*

Wood used for obtaining fire by friction, *Macartney*.

Wood of a light colour, coarse-grained, easy to work, and strong.—*Bailey's Cat. Pl. Woods* No. 287.

3. **C. subcordata** (nearly heart-shaped leaves), *Lam.*; *DC. Prod.* ix. 477; *Benth. Fl. Austr.* iv. 355. A moderate-sized spreading tree, the young shoots pubescent. Leaves on rather long petioles, very broadly ovate, acute or acuminate, often slightly cordate at the base, the upper surface scabrous with small scattered hairs, bearded underneath with short hairs in the axils of the principal veins or along their whole length, 4 to 6 in. long. Flowers not numerous, large, in shortly pedunculate loose cymes. Calyx tubular, about  $\frac{1}{2}$  in. long, without prominent ribs, shortly and irregularly lobed, enlarged after flowering and closing over the fruit. Corolla broadly funnel-shaped, 2 or 3 times as long as the calyx, with 5 to 7 broad lobes, much shorter than the tube, spreading to from 1 to  $\frac{1}{2}$  in. diameter. Anthers included in the tube. Style forked, each branch with 2 spatulate stigmatic lobes. Drupe nearly globular but contracted at the top, about 1 in. diameter, completely enveloped in the enlarged calyx.—*Seem. Fl. Vit.* t. 34; *C. orientalis*, *R. Br. Prod.* 498; *Rumph. Herb. Amb.* ii. t. 75.

Hab.: Islands of the Gulf of Carpentaria, *R. Browne, Henne*, Hope Islets, *McGillivray*; Port Denison, *Fitzalan*.

The species is also on the Mozambique coast and Comoro Islands, and in the Indian Archipelago extending to the Philippines and Pacific Islands; in India perhaps only where cultivated. Abundant in New Guinea.

2. **EHRETIA**, Linn.

(After D. G. Ehret.)

Calyx deeply divided into 5 segments. Corolla with a short or cylindrical tube; limb of 5 spreading lobes, imbricate in the bud. Stamens inserted in the tube; anthers exserted or rarely almost included. Ovary 2-celled with 2 ovules in each cell, or 4-celled with 1 ovule in each cell; style terminal, more or less 2-lobed or forked, the lobes entire, without any prominent ring. Fruit a drupe, the endocarp forming 2 2-seeded or 4 1-seeded pyrenes. Seeds with a membranous testa and usually scanty albumen; cotyledons ovate, not folded. — Trees or shrubs, often glabrous. Leaves entire or toothed. Flowers rather small, usually white, in panicles or cymes, either terminal in the upper axils or rarely all axillary. Bracts small. Fruits usually much smaller than in *Cordia*.

The genus is widely distributed over the tropical regions of the New as well as the Old World. Of the Australian species, 2 are common E. Indian ones, the 3 others are endemic.

SECT. I. **Euehretia**.—Flowers in irregularly branched panicles. Ovary 4-celled, with 1 ovule in each cell.

Leaves glabrous underneath, rather narrow. . . . . 1. *E. acuminata*.  
Leaves pubescent underneath, usually broad . . . . . 2. *E. pilosula*.

SECT. II. **Bourrerioides**.—Flowers in divaricately dichotomous cymes. Ovary 2-celled, with 2 ovules in each cell.

Corolla-tube longer than the calyx; lobes shorter. Cymes mostly terminal.

Leaves oblong or lanceolate.

Leaves long-lanceolate, with very oblique veins. Anthers included in the tube or scarcely exserted . . . . . 3. *E. saligna*.

Leaves oblong or oblong-lanceolate, the veins rather oblique. Anthers quite exserted . . . . . 4. *E. membranifolia*.

Corolla-tube not longer than the calyx; lobes twice as long. Cymes small, lateral. Leaves mostly ovate . . . . . 5. *E. laevis*.

1. ***E. acuminata*** (leaves acuminate), *R. Br. Prod.* 497; *Benth. Fl. Austr.* iv. 387. A tall shrub or tree of 20 to 30ft., quite glabrous, except the inflorescence, which is slightly pubescent. Leaves petiolate, oval or elliptical-oblong, shortly and obtusely acuminate, usually narrowed at the base, serrate with callous teeth, 3 to 6in. long. Flowers sessile and crowded on the branchlets of dense thyrsoid panicles, terminal and in the upper axils, scarcely exceeding the leaves. Calyx-segments about  $\frac{3}{4}$  line long, nearly orbicular, ciliate. Corolla-tube exceedingly short; lobes spreading to about 3 lines diameter. Anthers exserted. Ovary 4-celled, with 1 laterally attached ovule in each cell; style-lobes in the typical form very short, clavate, truncate and usually connivent. Fruit globular, 2 to 3 lines diameter, the endocarp separating into 2 hard 2-celled 2-seeded pyrenes.—*DC. Prod.* ix. 503; *E. serrata*, *Roxb. Wight Ill.* t. 170.

Hab.: Moreton Bay and other southern localities.

Wood light-brown; grain coarse; firm; easy to work; resembles closely the English Elm. — *Bailey's Cat. Ql. Woods* No. 287a.

Var. *laciflora*. Leaves less toothed, sometimes almost entire. Style divided nearly to the base. The differences in the style may, however, depend on a certain degree of unisexuality. — *Benth.*

2. ***E. pilosula*** (slightly hairy), *F. v. M. Frapin.* v. 20; *Benth. Fl. Austr.* iv. 388. A handsome tree of 20 to 30ft., closely allied to *E. acuminata*, and probably a variety, with the leaves broader, rounded or almost cordate at the base, and more or less pubescent or villous underneath. Inflorescence, flowers, and fruit the same as in *E. acuminata*.

Hab.: Seriview Range; Rockingham Bay and Herbert River, *Nullachy*; Forest Hill, Mackay, *W. Macartney*.



3. ***E. saligna*** (Willow-leaved), *R. Br. Prod.* 497; *Benth. Fl. Austr.* iv. 388. A shrub or tree, quite glabrous, the foliage apparently glaucous. Leaves long-lanceolate or linear, tapering to a fine point, quite entire, contracted into a rather long petiole, rather thick, very obliquely veined, 2 to 5 in. long. Flowers in divaricately dichotomous shortly pedunculate cymes. Calyx-segments narrow-ovate, almost acute,  $\frac{3}{4}$  line long. Corolla-tube cylindrical, fully 1 line long; lobes very spreading, nearly as long as the tube. Anthers included in the tube or very shortly protruding. Ovary 2-celled, with two ovules in each cell. Style deeply forked, with obtuse stigmas. Fruit about 2 lines diameter, containing 4 distinct, not very hard pyrenes.—*DC. Prod.* ix. 504.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*: Cape York Peninsula and other northern localities.

Wood of a pretty orange colour, close-grained, and hard: useful for turnery and cabinet work.—*Bailey's Cat. Ql. Woods* No. 288.

4. ***E. membranifolia*** (leaves thin), *R. Br. Prod.* 497; *Benth. Fl. Austr.* iv. 388. A shrub or tree, quite glabrous, with slender branchlets. Leaves oblong or oblong-lanceolate, obtuse, membranous, obliquely veined but not near so much so as in *E. saligna*,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. long, on slender petioles. Flowers small, in loosely divaricate, shortly pedunculate, dichotomous cymes. Calyx-segments broad, rounded, ciliate, about  $\frac{1}{2}$  line long. Corolla-tube  $\frac{3}{4}$  to nearly 1 line long, the lobes rather shorter than the tube. Anthers wholly exserted. Ovary 2-celled, with 2 ovules in each cell; style shortly or deeply forked. Fruit red.—*DC. Prod.* ix. 504.

Hab.: Darling Downs, Barcoo and Gilbert Rivers, *F. v. Mueller*; BROADSOUND, *R. Brown, Bowman*; Araucaria Range, *F. v. Mueller*; Rockhampton, *Dallachy, O'Shanesy*; Suttor River and Crocodile Creek, *Bowman*.

5. ***E. lævis*** (smooth), *Rarb. Pl. Corom.* i. 42 t. 56; *Benth. Fl. Austr.* iv. 389. A tall shrub or tree, quite glabrous. Leaves ovate oval or elliptical, acutely acuminate or rarely obtuse, quite entire, rounded or tapering at the base, shining above, mostly 3 to 5 in. long. Flowers small, in axillary, shortly pedunculate, dichotomous cymes, much shorter than the leaves. Calyx-segments narrow, under 1 line long. Corolla-tube about as long as the calyx, the lobes twice as long, spreading. Anthers exserted. Ovary 4-celled, with 1 ovule in each cell. Style more or less forked. Drupe small, containing 4 1-seeded pyrenes.—*DC. Prod.* ix. 505; *Wight. Ic.* t. 1382; *Bedd. Fl. Sylv.* t. 246: *Brand. For. Fl.* 340 t. 42; *Beurrieria laris* and *punctata*, *G. Don*, *Gen. Syst.* iv. 390.

Hab.: Cape York, *W. Hill*.

The species is common in East India and Ceylon. Wight's figure represents well the Australian form, Roxburgh's an equally common East Indian one with more obtuse leaves. *Benth*

### 3. **COLDENIA**, Linn.

(After Cadwallader Colden, Governor of New York in 1761.)

(*Lobophyllum*, *F. v. M.*)

Calyx deeply divided into 4 or 5 segments. Corolla with a short cylindrical tube; lobes 4 or 5, spreading, imbricate in the bud. Stamens inserted in the tube; anthers included. Ovary entire, 4-celled, with 1 pendulous ovule in each cell; style terminal, bifid or divided to the base into 2 styles, with a capitate or clavate stigma on each branch or style. Fruit more or less 4-lobed, dry or scarcely succulent, separating into 2 hard 2-celled carpels or finally into 4 1-seeded

nuts. Seeds with a very thin (or without any ?) albumen, the cotyledons not folded.—Hispid herbs. Leaves toothed or lobed. Flowers small, solitary in the axils, the upper ones often forming one-sided leafy spikes.

The Australian species is a common one in tropical Asia and Africa.

1. **C. procumbens** (procumbent), *Lin.*; *DC. Prod.* ix. 558; *Benth. Fl. Austr.* iv. 391. A hard, prostrate, hirsute annual, the branches radiating from the crown of the root to a considerable length, but not rooting. Leaves petiolate, obovate or oblong, much undulate, wrinkled and crenate or obtusely lobed, the largest ones scarcely exceeding 1 in., the floral ones usually very small. Flowers nearly sessile in their axils, often forming leafy spikes on the branchlets, usually 4-merous, at least in the Australian specimens. Calyx-segments herbaceous, ovate-lanceolate, not 1 line long. Corolla scarcely exceeding the calyx, the lobes broad, shorter than the tube, glabrous inside. Style bifid. Fruit depressed-globular, glandular-hispid, about 1 line long, more or less distinctly 4-lobed and often with prominent ribs between the lobes.—*Lobophyllum tetrandrum*, F. v. M. in Hook. Kew Journ. ix. 21; *Gärtn. Fruct.* i. 329 t. 68.

Hab : Towards Cooper's Creek.

The species is common in a great part of tropical Asia and Africa.

#### 4. HALGANIA, Gaudich.

(After Admiral Halgan.)

Calyx deeply divided into 5 segments. Corolla with a very short tube, rotate with 5 broad lobes in the bud. Stamens 5, inserted in the throat, the filaments very short and flat; anthers erect, connate in a short cylinder contracted into a long straight beak, formed of the linear terminal appendages of the anthers, enclosing the style. Ovary entire, 4-celled, with 1 pendulous ovule in each cell; style terminal, filiform, with a minute stigma. Fruit dry or the exocarp very slightly succulent, separating into 2 carpels, each with a crustaceous 2-celled endocarp. Seeds 1 in each cell, more or less albuminous; embryo terete, straight.—Undershrubs or small much-branched shrubs, rarely entirely herbaceous, more or less tomentose or hirsute, or rarely glabrous. Leaves entire or toothed. Flowers blue purple or white, often rather large and showy, in terminal or at length lateral cymes, sometimes reduced to short simple spikes or almost to single flowers. Bracts few or none.

The genus is limited to Australia.

1. **H. strigosa** (strigose), *Schlecht. Linnæa*, xx. 614; *Benth. Fl. Austr.* iv. 402. An erect branching shrub, the stems and foliage scabrous with a minute glandular tomentum, and more or less sprinkled or covered with short rigid appressed hairs. Leaves narrow-oblong or linear-cuneate, mostly 3-toothed at the end, and sometimes with 1 or 2 small teeth on each side lower down, the midrib very prominent underneath, otherwise flat, complicate or the margins very slightly recurved, rarely above  $\frac{1}{2}$  in. long except in some very luxuriant specimens. Flowers small, calyx-segments acute. Corollas deep-blue, the lobes often acute or shortly acuminate but sometimes quite obtuse. Fruit transversely rugose and rather acute.—*H. tuberculosa*, *Schlecht. Linnæa*, xx. 615; *H. cyanea*, *Lindl. Swan Riv. App.* 40.

Hab.: Armadilla, *Bartov*, and other southern localities.

#### 5. TOURNEFORTIA, Linn.

(After Joseph Pitton de Tournefort.)

Calyx deeply divided into 5 segments. Corolla-tube cylindrical; lobes 5, spreading, imbricate or induplicate in the bud. Stamens inserted in the tube; anthers included. Ovary entire, 4-celled, with 1 pendulous ovule in each cell;

style terminal, entire, the stigmatic summit entire or notched, surrounded by a prominent fleshy ring (except in *T. sarmentosa*). Fruit a drupe, with 4 1-seeded pyrenes, either quite distinct or more or less cohering in pairs or quite united in a 4-celled putamen. Seeds with or without albumen, the cotyledons not folded.—Trees shrubs or woody climbers, rarely (in species not Australian) almost herbaceous, tomentose villous or rarely almost glabrous. Leaves undivided and entire. Flowers usually white or nearly so, in unilateral spikes, arranged in dichotomous cymes, usually without bracts. Fruits small.

The genus is widely distributed over the tropical regions of the New and the Old World. Of the 3 Australian species, 2 are in the Indian Archipelago, and extend from the islands of the African coast to those of the South Pacific, the third is endemic. The genus is a natural one, distinguished from *Heliotropium* by the drupaceous fruit, from *Ehretia* chiefly by the style. The fleshy annulus round the summit, which *Tournefortia* has in common with *Heliotropium*, and which Fresenius (in Mart. Fl. Bras.) considers as an absolute character of the proposed Order of *Heliotropiææ*, is, however, wanting in *T. sarmentosa*.—*Benth.*

- |                                                                                                                        |                         |
|------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Corolla-lobes longer than the tube, imbricate in the bud. Foliage and inflorescence very densely silky-tomentose       | 1. <i>T. argentea</i> . |
| Corolla-lobes shorter than the tube, plicate and induplicate in the bud. Foliage tomentose hirsute or nearly glabrous. |                         |
| Corolla-lobes rather acute. Stigma surrounded by a fleshy ring. Erect tree or shrub                                    | 2. <i>T. mollis</i>     |
| Corolla-lobes obtuse or retuse. Stigma not thickened. Branches long weak or climbing                                   | 3. <i>T. sarmentosa</i> |

1. **T. argentea** (silvery), *Linn. f.; R. Br. Prod.* 497; *Benth. Fl. Austr.* iv. 389. A tall erect shrub, the branches, foliage, and inflorescence densely tomentose or villous with soft silky hairs. Leaves crowded at the ends of the thick branchlets, obovate ovate or obovate-oblong, soft and thick, 4 to 6 in. long, narrowed into a short petiole. Flowers small, sessile, and numerous, in large, dense, terminal dichotomous cymes or panicles. Calyx-segments orbicular, ciliate, about 1 line diameter. Corolla shortly exceeding the calyx, the lobes broad, obtuse, longer than the tube, imbricate in the bud, glabrous inside, sprinkled with a few hairs outside. Anthers ovate, mucronulate. Hypogynous disk prominent or obscure. Style exceedingly short, the thick fleshy annulus surrounding the notched summit appearing almost sessile on the ovary. Fruit glabrous, nearly globular, with 2 opposite furrows, but containing 4 distinct pyrenes. Seeds without any (or with a thin ?) albumen. *DC. Prod.* ix. 514; *Rumph, Herb. Ambion.* iv. t. 55.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Albany Island, *W. Hill*; Barnard Isles, *M'Gillivray*; Howick's group, *F. v. Mueller*; estuary of the Burdekin, *Fitzalan*; Rockingham Bay, *Dallachy*.

The species extends along the seacoasts of Eastern tropical Africa, the Mauritius, Ceylon, the Eastern Archipelago, New Caledonia, and the Islands of the Pacific.

2. **T. mollis** (soft), *F. v. M. Fragm.* i. 59; *Benth. Fl. Austr.* iv. 390. An erect not much branched shrub of several feet, the branches and foliage velvety-pubescent. Leaves from broadly ovate to ovate-lanceolate, obtuse or obtusely acuminate, often rugose, 2 to 4 in. long or longer on barren shoots. Cymes dichotomous, pedunculate, the pedicels exceedingly short, without bracts. Calyx-segments lanceolate, pubescent, about 1 line long. Corolla pubescent outside, the tube  $1\frac{1}{2}$  to 2 lines long, somewhat contracted upwards; lobes broad, much plicate, rather acute, about one-third as long as the tube, induplicate in the bud. Ovary tapering into a short style, the stigma with a thick broad fleshy ring, round a slightly-depressed obscurely 2-lobed centre. Fruit nearly globular, above 2 lines diameter when full grown, containing either 4 pyrenes or 2 pyrenes each one readily divisible into 2. Seeds with a rather thick albumen.

Hab.: Burdekin River, *F. v. Mueller*; Edgecombe Bay, Port Denison, and Herbert River, *Dallachy*.

3. **T. sarmentosa** (sarmentose), *Lam. Illustr.* i. 416: *Benth. Fl. Austr.* iv. 390. A tall shrub with weak branches, or sometimes climbing to a great height, glabrous or sprinkled with short rigid hairs. Leaves petiolate, ovate, acuminate, entire, 2 to 4 in. long, either glabrous or sprinkled with short hairs above, more or less pubescent or hirsute underneath. Flowers usually white, sometimes blue, sessile along the divaricate branches of terminal dichotomous cymes, without bracts. Calyx-segments lanceolate, shortly pubescent, under 1 line long. Corolla-tube angular, varying from  $1\frac{1}{2}$  line to above  $2\frac{1}{2}$  lines in length; lobes broad, obtuse or retuse, undulate-plicate, with a thick midrib, induplicate in the bud. Ovary tapering into a short style, which is very shortly lobed at the top, but without the thickened ring of the other species. Fruit ovoid-globular, slightly compressed, the endocarp thick, of a loosely cellular texture although hard, with 4 very small real cells, and sometimes separating or separable into 2 2-celled pyrenes.—DC. Prod. ix. 516: *T. orientalis*, R. Br. Prod. 497; DC. Prod. ix. 516; *T. acclinis*, F. v. M. Fragm. iv. 95.

Hab.: Cape York, *Dumal*: Endeavour River, *Banks and Solander*, R. Brown; Port Denison, *Fitzalan*; Edgecombe and Rockingham Bays, *Dallachy*; Rockhampton, *Thozet* and several others: Broadsound and Amity Creek, *Bowman*; Port Mackay, *Nerust*.

The species is also in the Mauritius, Timor, the Philippines, and probably in other islands of the Indian Archipelago.

## 6. HELIOTROPIUM, Linn.

(From the flowers having been supposed to turn to the sun;  
English name, "Turnsole.")

(*Schleidenia*, *Endl.*)

Calyx deeply divided into 5 segments. Corolla with a cylindrical tube: lobes 5, spreading, plicate and imbricate in the bud. Stamens inserted in the tube; anthers often mucronate or acuminate and sometimes cohering by their tips, included or the tips slightly protruding. Ovary entire, 4-celled, with 1 laterally attached or pendulous ovule in each cell; style terminal, short or long, the stigma or stigmatic summit broadly umbrella-shaped or with a fleshy ring surrounding the base of a more or less distinct central cone or point. Fruit more or less 2 or 4-lobed or furrowed, separating into 4 1-seeded nuts, or in species not Australian into 2 hard 2-seeded carpels. Seeds with a scanty or rarely with a rather thick albumen.—Herbs undershrubs or rarely shrubs, with appressed and strigose or with rigid and spreading hairs, very rarely glabrous. Flowers usually small, sessile or pedicellate in one-sided simple or once or twice-forked spikes, with or without bracts, which when present are often not immediately under the pedicels.

The genus is widely dispersed over the tropical and subtropical regions of the globe, a few species extending beyond the tropics both in the northern and the southern hemispheres. All the Australian species except one belong to the genus or section of *Heliotropium* proper as limited by De Candolle, or to *Heliotropium* and *Schleidenia* as defined by Fresenius (in Mart. Fl. Bras.) The section *Heliophytum*, with the fruit separating into 2 2-seeded carpels, established by De Candolle as a genus, comprises the *H. indicum*, Linn., a very common S. Asiatic weed.

SECT. I. **Platygyne**. Stigma nearly sessile, umbrella-shaped, without any distinct central cone.

Glabrous and glaucous prostrate perennial . . . . . 1. *H. curassavicum*.

SECT. II. **Euheliotropium**.—Stigma a thick ring at the base of or round a central cone or point. Anthers obtuse or shortly acuminate, not cohering (except in *H. brachygyne*?) Throat of the corolla not bearded.

Flowers in scorpioid forked or rarely simple spikes, without bracts.

Leaves oblong or lanceolate, petiolate or contracted at the base into a very short petiole. Style longer than the stigma . . . . . 2. *H. asperimmum*.

Flowers few, sessile within the uppermost leaves or forming leafy spikes. Leaves sessile, small.

Leaves linear-lanceolate, rather crowded. Anthers scarcely pointed.

Style longer than the stigma . . . . . 3. *H. fasciculatum*.

Leaves lanceolate or linear, distant. Anther-points long. Style very short . . . . . 4. *H. brachyggyne*.

SECT. III. **Schleidenia**.—*Stigma a thick ring round a central cone or point. Anthers acuminate, cohering by the minutely hairy tips Corolla-throat bearded or pubescent inside.*

Corolla-tube scarcely swollen. Style shorter than the stigma. Calyx-segments very unequal.

Leaves obovate-oblong or lanceolate, flat. Spikes without bracts . . . 5. *H. ovalifolium*.

Leaves linear with revolute margins. Spikes bracteate . . . . . 6. *H. strigonum*.

Leaves lanceolate. Flowers axillary, scarcely forming leafy spikes . . 4. *H. brachyggyne*.

Corolla-tube swollen round the anthers at or above the middle. Style as long as or longer than the stigma.

Leaves lanceolate or linear-lanceolate, flat or with recurved margins, mostly acute and above  $\frac{1}{2}$  in. long. Bracts leaf-like. Plant hirsute or pubescent.

Stems long and prostrate. Corolla-limb longer than the tube.

Bracts small . . . . . 7. *H. prostratum*.

Stems diffuse. Bracts longer than the calyx, petiolate or contracted at the base . . . . . 8. *H. bracteatum*.

Stems ascending or erect. Bracts longer than the calyx, sessile. Leaves rather crowded, narrow. Nuts usually 4 . . . . . 9. *H. pauciflorum*.

Leaves oblong-lanceolate, obtuse, crowded, under 2 lines long. Bracts leaf-like, imbricate. Plant cottony-white . . . . . 10. *H. filaginoides*.

Leaves all narrow-linear, with revolute margins. Bracts rarely exceeding the calyx, usually few and small. Nuts usually scabrous-pubescent. Stigmatic cone very short.

Erect slightly-branched annual. Hairs spreading. Corolla-tube very slender . . . . . 11. *H. ventricosum*.

Stem paniculately branched. Hairs appressed. Calyx-segments acuminate.

Calyx 2 lines long. Leaves linear . . . . . 12. *H. tenuifolium*.

Calyx 1 line long. Leaves filiform . . . . . 13. *H. paniculatum*.

SECT. IV. **Heliophytum**.—*Fruit mitriform, subacutely 4-pointed.*

Leaves petiolate, ovate, subserrate. Spikes elongate, dense, ebracteate.

Fruit separating into 2 2-seeded 2 pointed pyrenes . . . . . 14. *H. indicum*.

Leaves sessile, margins undulate. Peduncles bearing usually 2 spikes . 15. \**H. anchusaeifolium*.

1. **H. curassavicum** (Curassavian), *Linn.: DC. Prod.* ix. 538; *Benth. Fl. Austr.* iv. 393. A much-branched prostrate glabrous and glaucous perennial, often somewhat succulent, spreading sometimes to 2 or 3 ft. Leaves linear oblanceolate or oblong, usually obtuse and narrowed into a short petiole, rarely obovate, rather thick, veinless except the midrib,  $\frac{1}{2}$  to 1 in. long. Spikes once-forked or rarely simple, terminal or lateral. Flowers sessile, without bracts. Calyx-segments obtuse, nearly 1 line long. Corolla white or with a yellow eye, the tube about 1 line long, the throat not bearded; lobes broad, as long as the tube. Anthers nearly sessile at the base of the tube. Ovary depressed-globular, capped by an umbrella-shaped almost sessile stigma, often broader than the ovary itself.—*Lehm. Pl. Preiss.* i. 348; *Bot. Mag. t.* 2669.

Hab.: Inland tropical localities.

The species is frequent in sandy places, chiefly on the seacoast, in North and South America, South Africa, and the Pacific Islands. The ovary and fruit are occasionally but rarely 3-merous (with 6 ovary-cells and nuts).—*Benth*

2. **H. asperrimum** (very rough), *R. Br. Prod.* 493; *Benth. Fl. Austr.* iv. 394. A perennial with erect or ascending stems of 1 to 1½ ft., the branches and foliage very scabrous and sprinkled with rigid spreading hairs. Leaves shortly petiolate,

oblong or lanceolate, obtuse, with undulate revolute margins but not very rugose, 1 to 2 in. long. Spikes short and dense, once or sometimes twice-forked, rarely simple, without bracts. Calyx-segments linear or lanceolate, hispid, 2 lines long. Corolla-tube shortly exceeding the calyx, the throat glabrous inside; lobes much plicate, very broad, expanding to  $\frac{1}{4}$  in. diameter. Anthers oblong, very shortly acuminate. Style filiform; stigmatic cone long and narrow, but shorter than the style.—DC. Prod. ix. 542; *H. foliatum*, Lehm. Pl. Preiss. ii. 238 (from the description given) not of R. Br.

Hab.: Inland localities.

3. **H. fasciculatum** (leaves bunched), *R. Br. Prod.* 494; *Benth. Fl. Austr.* iv. 395. An erect hard annual, looking almost woody at the base, with rigid divaricate branches and hispid with rigid half-spreading hairs. Leaves rather crowded, sessile, linear-lanceolate or lanceolate, acute, with thickened nerve-like rigidly ciliate margins, all except a few on the main stem under  $\frac{1}{2}$  in. long. Flowers few, scattered, sessile amongst the upper floral leaves, scarcely forming leafy spikes. Calyx-segments lanceolate, rather acute, hispid, about 1 line long. Corolla hirsute, the tube rather longer than the calyx, the throat glabrous inside. Anthers ovate-triangular, scarcely acuminate. Style terete, more than twice as long as the ovary; stigma very broad, the thick cone rather shorter than the style.—DC. Prod. ix. 547.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

4. **H. brachygynæ** (style short), *Benth. Fl. Austr.* iv. 396. Diffuse or much branched and hirsute, probably annual, some specimens almost erect and scarcely 6 in. high, others very diffuse with branches of above 1 ft. Leaves lanceolate or oblong-linear, obtuse, with revolute margins, narrowed at the base but sessile, under  $\frac{1}{2}$  in. long. Flowers few in the uppermost axils, forming very short leafy spikes, the floral leaves or bracts as long as or longer than the calyx. Calyx-segments about  $1\frac{1}{4}$  line long, rather obtuse and somewhat unequal. Corolla-tube shorter than the calyx, not ventricose nor bearded in the throat; lobes shorter than the tube. Anthers with rather long connivent points. Style very short, with a broad, thick stigma and a very small central cone. Fruit depressed-globular, the nuts scabrous.

Hab.: Burnett River, *F. v. Mueller*.

5. **H. ovalifolium** (leaves oval), *Forsk.; R. Br. Prod.* 493; *Benth. Fl. Austr.* iv. 396. A procumbent or diffuse annual, hoary or white all over with appressed rigid or silky hairs. Leaves petiolate, oval obovate or oblong, very obtuse in the common form, entire, the veins not very prominent, mostly  $\frac{3}{4}$  to 1 in. long. Spikes rather slender, simple or once-forked, without bracts. Calyx-segments hirsute, not 1 line long, one much broader than the other four. Corolla-tube hirsute, not 1 line long, the throat bearded inside with a ring of reflexed hairs sometimes reduced to very few; lobes rather shorter than the tube. Anthers inserted below the middle of the tube, ovate, acuminate, the points nearly as long as the cells and usually cohering at the tips by minute terminal tufts of hairs. Stigma with a linear-conical point, longer than the very short style. Nuts small, hispid.—*H. coromandelianum*, Retz; DC. Prod. ix. 541; Wight, Ic. t. 1388.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Port Denison, *Fitzalan*; Rockingham and Edgecombe Bays, *Dallachy*; Rockhampton, *O'Shanesy*; Broadsound, Nercool Creek, Bowen River, *Bowman*.

The species is common in tropical and northern Africa and East India.

Var. *oblongifolium*, DC. Erect slender and not much branched, the leaves narrower and less obtuse. — *H. gracile*, R. Br. Prod. 493. — Islands of the Gulf of Carpentaria, R. Brown; Keppel Bay, Thozet.

6. **H. strigosum** (strigose), Willd.; DC. Prod. ix. 546; Benth. Fl. Austr. iv. 397. An erect or diffuse much-branched annual, more or less hoary or sprinkled with appressed rigid hairs. Leaves linear, obtuse or scarcely acute, with revolute margins, under 1 in. long. Flowers small, distant, forming slender interrupted scarcely scorpioid spikes, interspersed with small bracts, at least in the lower part. Calyx-segments about 1 line long, strigose-hispid, rather obtuse, the outer ones broader than the inner. Corolla-tube not exceeding the calyx, slightly swollen round the anthers, the throat bearded inside; lobes rather shorter than the tube. Anthers acuminate, cohering by the tips of the points. Style short, the stigmatic cone broad, about as long as the style. Nuts nearly globular, shortly pubescent.

Hab.: Bowen River, *Boorman*, and several other inland localities.

The species is widely spread over the warmer regions of northern Africa and western Asia.

7. **H. prostratum** (prostrate), R. Br. Prod. 494; Benth. Fl. Austr. iv. 397. Stems prostrate, 1 to 2 ft. long in the specimens seen, strigose as well as the foliage with short hairs. Leaves distant, linear-lanceolate or lanceolate, acute, contracted at the base but scarcely petiolate, flat or the margins scarcely recurved,  $\frac{3}{4}$  in. to 1 in. long. Flowers distant, in a long interrupted terminal spike, the bracts oblong, leafy, but scarcely exceeding the calyx. Calyx-segments lanceolate, obtuse, strigose,  $1\frac{1}{4}$  line long. Corolla-tube as long as the calyx, ventricose at or above the middle, bearded in the throat; limb longer than the tube, broadly plicate, shortly lobed. Anthers acuminate and cohering at the tips. Stigmatic cone about half as long as the filiform style. — DC. Prod. ix. 548.

Hab.: Islands of the Gulf of Carpentaria, R. Brown.

8. **H. bracteatum** (bracteate), R. Br. Prod. 493; Benth. Fl. Austr. iv. 397. A hispid annual, either erect and branching or with several stems ascending from the base, under 1 ft. high. Leaves more or less petiolate, lanceolate, rather acute, narrowed at the base, flat or the margins slightly recurved, from under  $\frac{1}{2}$  to about  $\frac{3}{4}$  in. long. Spikes terminal, leafy, 1-sided but scarcely scorpioid, the leafy bracts more or less petiolate or very much contracted at the base, as long as or longer than the calyx. Calyx-segments lanceolate, about  $1\frac{1}{2}$  line long. Corolla-tube rather shorter than the calyx; ventricose at or below the middle, the throat bearded inside, the lobes shorter than the tube. Anthers acuminate, cohering at the tips. Stigmatic cone slender, but shorter than the filiform style. Nuts minutely pubescent, the segments of the fruiting calyx usually elongated and spreading. — DC. Prod. ix. 547; *H. foliatum*, R. Br. Prod. 493; DC. Prod. ix. 548.

Hab.: Islands of the Gulf of Carpentaria, R. Brown.

The specimens of *H. foliatum* seem to me to represent a rather luxurious form of *H. bracteatum*, with larger, more distinctly petiolate bracts. — Benth.

Var. *leptostachyum*. Diffuse and much branched, 1 ft. long or more. Leaves shortly petiolate, acute. Style rather shorter. — Cape York, *Decmel*.

9. **H. pauciflorum** (flowers few), R. Br. Prod. 493; Benth. Fl. Austr. iv. 398. An erect, much-branched, very hispid, leafy annual, under 6 in. high. Leaves very shortly petiolate, linear-lanceolate, with revolute margins, under  $\frac{1}{2}$  in. long. Flowers shortly pedicellate, rather distant, with leafy bracts between them longer than the calyx, forming single terminal leafy spikes or racemes scarcely scorpioid. Calyx-segments about  $1\frac{1}{2}$  line long, lanceolate, hispid, the outer ones rather larger than the inner. Corolla-tube shorter than the calyx, bearded inside at the throat, the lobes about as long as the tube. Anthers

acuminate, the points cohering by their minutely hairy tips. Stigmatic cone rather long, but shorter than the filiform style. Nuts small, scabrous with short hairs.—DC. Prod. ix. 547.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Suttor River, *Thozet*; Nerkool Creek, *Borman*.

10. **H. filaginoides** (Filago-like), *Benth. Fl. Austr.* iv. 398. A dwarf erect much-branched corymbose plant, apparently shrubby, clothed in every part with a white cottony-wool. the specimen seen complete with the root, but scarcely 4in. high. Leaves crowded and almost imbricate towards the end of each year's shoot, oblong-lanceolate, obtuse, with recurved margins, not 2 lines long. Flowers small, in dense terminal cymes almost contracted into heads, sessile within the imbricate bracts, which are as long as the calyx. Calyx-segments oblong-lanceolate, obtuse, rather above 1 line long. Corolla not 2 lines long, the lobes about as long as the tube, with a ring of hairs in the throat. Anthers acuminate with long exerted points, connected by the minute hairs of their tips. Style very short: the stigmatic ring broad and cup-shaped, with a small central cone. Fruit not seen.

Hab.: Towards Cooper's Creek, *Howitt's Expedition*.

11. **H. ventricosum** (corolla-tube swollen), *R. Br. Prod.* 494; *Benth. Fl. Austr.* iv. 399. An erect corymbosely-branched annual of  $\frac{1}{2}$  to 1ft., becoming diffuse when old, hirsute with rigid strigose or spreading hairs. Leaves narrow-linear, acute, with revolute margins, rarely above  $\frac{1}{2}$ in. long. Flowers in short compact spikes, interspersed with long leaf-like bracts, all as well as the calyxes very hispid. Calyx-segments narrow, shorter than the corolla-tube. Corolla-tube about 2 lines long, slender to above the middle, ventricose below the throat, which is pubescent inside. Anthers small, acuminate, the points connected by the minutely hairy tips. Style long and filiform, with a short stigmatic cone. Fruit tipped by the persistent base of the style, the nuts small, minutely strigose or nearly glabrous.—DC. Prod. ix. 547.

Hab.: Gulf of Carpentaria, *R. Brown*; Port Denison, *Fitzalan*; several other localities in the tropics.

12. **H. tenuifolium** (thin leaves), *R. Br. Prod.* 494; *Benth. Fl. Austr.* iv. 399. Stems erect, branching, hard or almost woody at the base, 1ft. high or more, more or less hoary as well as the foliage with short appressed hairs. Leaves linear, acute or almost obtuse, with revolute margins,  $\frac{3}{4}$  to  $1\frac{1}{2}$ in. long. Flowers distant, forming interrupted once or twice-forked spikes, interspersed especially at the base with a few bracts, which are rarely entirely wanting. Calyx glabrous or strigose, the segments very acute, about 2 lines long, the 2 outer ones often larger than the others. Corolla-tube about as long as the calyx, ventricose above the middle, shortly bearded in the contracted throat, the limb nearly as long as the tube. Anthers acuminate, the points cohering by their minutely hairy tips. Style slender, the stigma broadly 4-lobed with a small central cone. Fruit tipped by the persistent base of the style, the nuts slightly scabrous-pubescent. Embryo usually curved.—DC. Prod. ix. 547.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Suttor River, *F. v. Mueller*, *Borman*; Bowen River, *Bowman*; not uncommon in other localities.

13. **H. paniculatum** (flowers in panicles), *R. Br. Prod.* 494; *Benth. Fl. Austr.* iv. 399, *not of Roxb.* Erect and paniculately branched with the habit of *H. tenuifolium*, but much more slender, more or less hirsute or nearly glabrous. Leaves linear-filiform, with revolute margins. Panicles at length very divaricate, with dichotomous filiform branches. Flowers very much smaller than in *H. tenuifolium*, but otherwise similar. Calyx 1 line long, strigose, with acutely acuminate segments. Corolla-tube rather longer than the calyx, ventricose



above the middle. Stamens and style of *H. tenuifolium*. Nuts small, ovoid, acute, very shortly scabrous-pubescent.—DC. Prod. ix. 547; *H. glabellum*, R. Br. Prod. 494; DC. Prod. ix. 548; *H. linifolium*, Wight. Ic. t. 1391.

Hab.: Islands of the Gulf of Carpentaria, R. Brown.  
Also in Ceylon and India.

14. **H. indicum** (Indian), Linn.; Clarke in Hook. Fl. Brit. Ind. iv. 152. A hirsute herbaceous annual. Stems 6 to 18 in. high. Leaves alternate or subopposite, petiolate, ovate subserrate, 1 to 4 in. long, more or less woolly. Spikes 1 to 8 in. long, mostly leaf-opposed, dense, ebracteate. Sepals about 1 line long, linear. Corolla-tube about  $1\frac{1}{4}$  line long, narrow-cylindrical; lobes small, round, crenate. Stigma conoid-linear. Fruit 2 lines long, ovoid, ribbed, soon separating into 2 mitre-like pyrenes; each pyrene with 2 cavities in addition to the seed-bearing cells.—*Tiaridium indicum*, Lehm. Asperifol. 14; Wight. Ill. t. 171; *Helioophytum indicum*, DC. Prod. ix. 556; Fresen. in Mart. Fl. Bras. xix. 48 t. 10, fig. 4.

Hab.: Recorded for Queensland by F. v. Mueller.

15. \***H. anchusæfolium** (Anchusa-leaved), Poir. Suppl. 3 p. 23. Stems erect and branching, arising from a somewhat creeping underground one, often exceeding 1 ft. high, whole plant covered with hoary strigose tomentum. Leaves alternate, about 2 in. long, and 6 lines broad, linear-lanceolate, semiamplexicaule, subundulate. Peduncles terminal, solitary, bifid and trifid. Calyx-lobes linear. Corolla blue: tube short.

Hab.: Buenos Ayres and Brazil. Met with on the rocks about Brisbane as a stray from garden culture.

## 7. TRICHODESMA, R. Br.

(Referring to the anthers being bound together by hairs.)

Calyx deeply divided into 5 segments. Corolla with a very short tube, almost rotate, with 5 acuminate lobes contorted in the bud. Stamens 5, inserted in the throat, the filaments very short and flat; anthers erect, linear, ciliate, cohering by the hairs in a cylinder contracted into a long spirally-twisted beak formed of the terminal appendages of the anthers. Ovary entire, 4-celled, with 1 pendulous ovule in each cell; style terminal, filiform, with a minute stigma. Fruit of 4 1-seeded nuts, attached by their whole inner face, which when detached leave 4 cavities in the thick persistent prominently 4-angled axis. Seeds without albumen; embryo straight, with a very short radicle.—Coarse hispid hoary or silky herbs. Leaves opposite or alternate, usually entire. Flowers in terminal one-sided simple or rarely forked racemes, usually accompanied by bracts.

The genus comprises very few species dispersed over the warmer regions of Asia and Africa. The only Australian species extends over nearly the whole range of the genus.

1. **T. zeylanicum** (of Ceylon), R. Br. Prod. 496; Benth. Fl. Austr. iv. 404. A coarse hard annual, usually erect, not much branched, and often attaining several feet, the indumentum very various, sometimes close and hoary or longer and silky, more frequently consisting of short rigid appressed hairs or long loose scattered ones, or the various hairs intermixed, the longer ones usually arising from prominent tubercles. Leaves in the Australian specimens mostly alternate or the lower ones opposite, more rarely nearly all (as is usually the case in Indian specimens) opposite, linear, linear-lanceolate or rarely broadly oblong-lanceolate, obtuse, often 3 to 4 in. long, the margins usually recurved. Flowers pale-blue, in simple racemes, with a leafy bract under each always shorter than the pedicel. Calyx-segments lanceolate, acuminate,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long at the time of flowering, narrow or broad, valvate or reduplicate, often cohering at

the base, sometimes much enlarged round the fruit. Corolla-lobes broad, longer than the calyx, the points narrow, spirally-twisted in the bud as well as the long anther-points. Nuts smooth and shining.—A. DC. Prod. x. 172, with the synonyms adduced; Bot. Mag. t. 4820; *Borago zeylanica*, Linn. Mant. 202; Burm. Fl. Ind. 41 t. 14, fig. 2; *Leiocarya Kotschyana*, Hochst. in Fl. 1844, 30.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown and others*; Keppel and Shoalwater Bays, *R. Brown*; common from Cape York to Moreton Bay and in the interior, *A. Cunningham*, *F. v. Mueller*, and many others.

Var. *latisepalum*, *F. v. M.* Calyx-segments short and broad, almost cordate but not auriculate.—Burdekin River, *F. v. Mueller*.

Var. *sericeum*. Stem and foliage very hoary with a close soft tomentum.—*T. sericeum*, Lindl. in Mitch. Trop. Austr. 258.—Belyando River, *Mitchell*.

The species is common in the E Indian peninsula, in Ceylon, and in tropical Africa. Camels are said to be particularly fond of this herb.

## 8. CYNOGLOSSUM, Linn.

(From *kyon*, a dog, and *glossa*, a tongue.)

(*Omphalodes*. *Mench.*)

Calyx deeply divided into 5 segments. Corolla with a short broad tube, the throat closed with scales opposite the lobes, the limb spreading, almost rotate, 5-lobed. Anthers enclosed in the tube. Ovary 4-lobed; style shortly filiform, inserted between the lobes, with a small usually capitate stigma. Nuts 4, depressed, attached by the inner end of the under surface or by the inner edge to the convex or hemispherical receptacle, the upper surface usually more or less covered with short hooked prickles or bordered by a raised often toothed margin. Seeds without albumen; radicle short.—Herbs clothed with stiff hairs, either appressed and hoary or spreading, sometimes reduced to scattered tubercles. Leaves most frequently entire. Flowers blue purplish or rarely white, in one-sided simple or forked racemes, with or without bracts.

The genus is widely dispersed over the temperate and warmer regions of the Old World. The Australian species appear to be all endemic.

- |                                                                                                                                                                      |                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Diffuse or straggling. Leaves ovate, petiolate. Floral leaves or bracts at or near all the pedicels . . . . .                                                        | 1. <i>C. latifolium</i> . |
| Erect. Leaves lanceolate or oblong. Nuts glochidiate all over. Pedicels longer than the calyx, with bracts at or near them all, or at least the lower ones . . . . . | 2. <i>C. suaveolens</i> . |
| Pedicels shorter than the calyx. Bracts none . . . . .                                                                                                               | 3. <i>C. australe</i> .   |
| Nuts glochidiate only on the raised margin or rarely along a central raised ridge. Bracts none . . . . .                                                             | 4. <i>C. Drummondii</i> . |

1. ***C. latifolium*** (broad-leaved), *R. Br. Prod.* 495; *Benth. Fl. Austr.* iv. 408. A perennial, with diffuse or straggling branching stems, extending sometimes to several feet, scabrous with scattered tubercles, which rarely lengthen into short hairs or prickles. Leaves petiolate, ovate, acute, quintuplinerved, the lower often at least 2 in. long, the upper ones gradually smaller and more sessile, ultimately reduced to small bracts. Flowers small, on slender recurved pedicels, usually by the side of or rather below the floral leaves or bracts. Calyx-segments rather broad, obtuse or shortly acuminate, about 1 line long but somewhat enlarged after flowering. Nuts obovate, spreading, convex, glochidiate all over, attached by the inner end of the under surface.—DC. Prod. x. 156; Hook. f. Fl. Tasm. i. 280.

Hab.: Not uncommon on damp land in southern localities.

2. **C. suaveolens** (sweet-scented), *R. Br. Prod.* 495; *Benth. Fl. Austr.* iv. 409. An erect stout coarsely-hirsute plant with a perennial stock, the stems slightly branched, 1 to 2ft. high. Radicle and lower leaves on long petioles, lanceolate or oblong, sometimes several inches long; stem-leaves few, on shorter petioles, the upper ones small, sessile, lanceolate. Racemes loose, more or less forked, with small leafy bracts below most of the pedicels. Pedicels longer than the calyx and sometimes 1in. long, recurved after flowering. Flowers white, the throat-scales yellow, very fragrant. Calyx-segments very open, narrow,  $1\frac{1}{2}$  line long. Nuts ovoid, spreading, flat or slightly convex, densely glochidiate outside, obliquely attached by their inner smooth face to the broad very prominent almost hemispherical receptacle. Seed flat or slightly concave. Embryo concave.—*DC. Prod.* x. 156; *Hook. f. Fl. Tasm.* ii. 368.

*Hab.*: Mostly in southern localities.

3. **C. australe** (Australian), *R. Br. Prod.* 495; *Benth. Fl. Austr.* iv. 409. An erect stout hispid perennial, usually taller than *C. suaveolens*, and the hairs of the lower part of the stem long and reflexed. Radical and lower leaves on long petioles, the upper ones nearly sessile, all lanceolate or the lower ones oblong, often several inches long. Flowers sweet-scented, light-blue or white, in long slender more or less forked racemes, without bracts, the pedicels rarely exceeding the calyx and mostly shorter. Calyx-segments shortly hispid, obtuse, about 1 line long. Nuts very spreading, depressed, obovate, either nearly flat or with a more or less raised and glochidiate margin, the whole surface also more or less glochidiate, attached to the convex or almost hemispherical receptacle by a small smooth portion at the inner end of their under surface. Seeds flat.—*DC. Prod.* x. 151; *Hook. f. Fl. Tasm.* ii. 368.

*Hab.*: Rockingham Bay, *J. Dallachy*; Herberton, *J. F. Bailey*; mostly in southern localities. The fruit of this species sometimes almost passes into that of the genus or section *Omphalodes*, although always glochidiate.—*Benth.*

4. **C. Drummondii** (after James Drummond), *Benth. Fl. Austr.* iv. 409. A tall erect hispid perennial like *C. australe*, and perhaps a variety. Hairs of the plant usually longer and looser than in *C. australe*, the pedicels often rather longer and occasionally a few bracts developed at the base of the raceme, the foliage, inflorescence, and flowers otherwise the same. Leaves here and there with large teeth. Nuts depressed, spreading, almost orbicular, with a much-raised membranous shortly fringed border, the enclosed upper concave surface quite smooth, or rarely with a slightly raised midrib bearing a few hooked prickles, the under surface convex and quite smooth, the attachment as in *C. australe*.

*Hab.*: Near the border of N.S.W.

## 9. ECHINOSPERMUM, Swartz.

(Seeds prickly, like a hedgehog.)

Calyx deeply divided into 5 segments. Corolla with a cylindrical tube, the throat with 5 small scales inside; lobes 5, spreading. Stamens inserted in the tube; anthers included. Ovary 4-lobed; style inserted between the lobes, with a small usually capitate stigma. Nuts 4, usually more or less muricate with hooked prickles, erect, laterally attached to a narrow-conical receptacle. Seeds without albumen, radicle short.—Herbs with the habit foliage and flowers of *Myosotis*, but the flowers usually interspersed with bracts.

A considerable genus dispersed over the temperate and mountainous regions of Europe and Asia, but scarcely tropical. The only Australian species appears to be endemic.

1. **E. concavum** (back of nut concave), *F. v. M. Fragm.* ii. 139; vi. 116; *Benth. Fl. Austr.* iv. 407. An annual, strigose or hoary with appressed hairs, looser on the main stems; stems either erect nearly simple and under 6in. high or longer, diffuse and almost woody at the base. Leaves linear or oblanceolate, the larger ones above 1in. long, the upper ones passing into the small floral leaves or bracts. Flowers in one-sided leafy racemes, the pedicels at first very short, but lengthening to  $\frac{1}{4}$ in. or more when in fruit. Calyx-segments about  $\frac{3}{4}$  line long, lanceolate, enlarging after flowering. Corolla about 1 line long, the tube with a ring of obtuse scales inside above the anthers, the lobes obovate-oblong, much shorter than the tube. Nuts about 2 lines long, very concave on the back, with thick raised almost involute margins bordered by stout conical glochidiate prickles, the enclosed area tuberculate.

Hab.: Southern localities to Cooper's Creek.

## 10. ERITRICHIMUM, Schrad.

(Plants woolly.)

Calyx deeply divided into 5 segments. Corolla with a cylindrical tube, the throat with 5 minute gibbosities or scales or quite naked, the limb spreading, 5-lobed. Stamens inserted in the tube, the anthers included. Ovary 4-lobed; style filiform, inserted between the lobes, with a small usually capitate stigma. Nuts 4, rugose or reticulate, erect, attached to the shortly pyramidal or convex receptacle by an oblique aureole, the inner angle prominent. Seeds without albumen; radicle short.—Herbs with the habit foliage and flowers nearly of *Myosotis*, but the inflorescence usually with bracts.

There is a considerable number of species dispersed over the temperate and mountainous regions of Europe and Asia, and in America descending from the United States along the line of the Andes to Chile. The only Australian one is endemic.

1. **E. australasicum** (Australian), *A. DC. Prod.* x. 134; *Benth. Fl. Austr.* iv. 406. Stems usually numerous, tufted diffuse or ascending, rarely nearly simple and erect, mostly under 6in. long, the whole plant hispid, the hairs often yellowish on the young shoots. Leaves linear, obtuse, the lower ones sometimes almost opposite, rarely exceeding  $\frac{1}{2}$ in., the upper ones smaller. Flowers very small, nearly sessile in the axils of the bracts, forming simple one-sided leafy spikes. Calyx-segments very hispid, linear, scarcely 1 line long. Corolla scarcely exceeding the calyx, the lobes shorter than the tube. Anthers small. Style short. Nuts shorter than the calyx, rugose, with much-raised reticulations.—*Heliotropium elachanthum*, *F. v. M. in Linnæa*, xxv. 424.

Hab.: Southern localities.

## 11. ROCHELIA, Reichenb.

(After Anthony Rochel.)

(*Maccoya*, *F. v. M.*)

Calyx deeply divided into 5 or more segments. Corolla with a cylindrical sometimes incurved tube, the throat with or without scales inside; limb spreading, 5-lobed or rarely 4 or 6-lobed. Stamens 5 or rarely fewer, included in the tube. Ovary 2-lobed, 2-celled, with 1 ovule in each cell; style inserted between the lobes, with a small usually capitate stigma. Nuts 2, erect, rugose, laterally attached to the narrow-conical receptacle. Seeds without albumen; radicle short.—Herbs with the habit of *Myosotis*, the inflorescence usually interspersed with bracts, the fruiting-calyx often more or less hardened at the base round the nuts.

The genus comprises very few species from the Mediterranean region of the northern hemisphere and from western Asia. The only Australian species is endemic, but is very nearly allied to one of the east Mediterranean ones. The genus is nearly allied to *Echinosperrum*, but has only 1 cell and ovule to each carpel.—*Benth.*

1. **R. Maccoya** (after Prof. Fredk. McCoy), *F. v. M.*; *Benth. Fl. Austr.* iv. 408. A hispid annual with several procumbent or ascending stems, a few inches in length. Leaves linear, the radical ones 1 in. long or even more, those of the stem few and small. Flowers on very short pedicels, usually below the floral leaves or bracts, the upper ones forming an irregular one-sided leafy raceme. Calyx about 2 lines long, oblique, incurved, divided into from 7 to 9 rather unequal linear-segments. Corolla shorter than the calyx, with 4 to 6 very short obtuse lobes, without scales in the throat. Stamens usually four. Nuts enclosed in the hardened base of the calyx-segments.—*Maccoya plurisepala*, F. v. M. *Fragm. i.* 127.

Hab.: Recorded for Queensland by F. v. Mueller.

In the few flowers I opened I found 7 calyx-segments and only 4 stamens, the corolla-lobes sometimes 5, sometimes 6; F. v. Mueller has observed as many as 9 calyx-segments. The species is nearly allied to *R. cancellata*, Boiss., which has a similar multiplication of calyx-segments but with the normal number of 5 corolla-lobes and stamens.—*Benth.*

## 12. MYOSOTIS, Linn.

(From *mus*, a mouse, and *ous*, an ear; appearance of leaves.)

(*Exarrhena*, R. Br.)

Calyx deeply divided into 5 segments or, in species not Australian, 5-toothed. Corolla with a cylindrical tube, with 5 small scales in the throat, the limb spreading, 5-lobed. Stamens inserted in the tube; anthers included or exerted. Ovary 4-lobed; style filiform, inserted between the lobes; stigma small, usually capitate. Nuts 4, smooth and shining, erect, attached by a small basal area. Seeds without albumen; radicle short.—Herbs usually hispid. Leaves entire. Flowers blue or white, in simple or forked one-sided spikes or racemes, without bracts.

The genus is chiefly abundant in the temperate regions of the northern hemisphere, especially in the Old World, more rare in North America, tropical Asia, and in the extratropical regions of the southern hemisphere.

1. **M. australis** (southern), R. Br. *Prod.* 495; *Benth. Fl. Austr.* iv. 405. An erect or diffuse hispid annual (or perennial?), the stems usually branching from the base, sometimes slender and under 6 in. high, sometimes long and weak, extending to 1 or 2 ft. Lower leaves on long petioles, from obovate-oblong to oblanceolate or linear-spathulate, the stem ones more sessile and smaller, the uppermost sometimes very small sessile and cordate-ovate. Flowers small, white or yellowish (or rarely blue?), in scorpioid spikes at first dense but at length often long and interrupted. Calyx-segments narrow-lanceolate, hispid with hooked hairs,  $\frac{3}{4}$  to  $1\frac{1}{4}$  line long. Corolla-tube rather longer than the calyx, the scales of the throat obtuse and notched, the lobes short, broad, obtuse or retuse. Anthers and style included in the tube or the tips slightly protruding. Nuts shorter than the calyx.—DC. *Prod.* x. 110; Hook. f. *Fl. Tasm.* i. 279; *M. staminea*, Lehm. *Pl. Preiss.* i. 348.

Hab.: Specimens received from near the border of N.S.W. seem to be this plant, but too imperfect to determine. Baron Mueller records it from New England

## 13. LITHOSPERMUM, Linn.

(From the Greek, stone seed.)

Sepals 5, linear. Corolla tubular funnel-shaped, throat naked or with 5 small scales; lobes 5, imbricate in bud, obtuse, spreading. Stamens 5, included; anthers oblong, obtuse, or apiculate. Ovary deeply 4-lobed; style filiform or cylindric; stigma usually 2-fid. Nuts 4, erect, ovoid, stony, smooth or rough;

scar flat, basal: receptacle nearly flat.—Herbs or undershrubs, hispid or rough. Leaves alternate. Flowers white blue or yellow, axillary, solitary or in terminal bracteate racemes.

The species are met with in Europe, Asia, Africa, and America.

1. **L. arvense** (Corn-field), *Linm.: DC. Prod.* x. 74. Corn Gromwell. A strigose annual weed, 6 to 18 in. high, erect. Leaves lanceolate, the lower ones petiolate obovate-oblong, stem ones about 1 in. long, 3 lines broad, the strigose hairs often from tuberculate bases. Racemes in fruit more than 4 in. long. Flowers white, rarely blue. Pedicels short. Corolla 3 lines long, hairy upwards: Nuts ovoid-oblong, tuberculate; sepals in fruit 3 or 4 lines long, hispid.

Hab: A weed on cultivated land; not certain if really indigenous.

## ORDER LXXXV. CONVOLVULACEÆ.

Flowers regular. Calyx free, persistent, of 5 distinct much imbricated sepals, rarely united in a 5-toothed or 5-lobed calyx. Corolla campanulate or funnel-shaped or rarely rotate or with a cylindrical-tube, the limb usually spreading, 5-angled or 5-lobed, folded in the bud or very rarely imbricate. Stamens 5, inserted in the tube, alternate with the lobes or angles of the corolla, often of unequal length; anthers versatile or almost erect, with 2 parallel cells opening by longitudinal slits. Ovary free, 2, 3 or 4-celled, rarely divided into 2 or 4 distinct carpels, with 1 or 2 erect or ascending ovules in each cell or carpel or 1-celled with 2 or 4 ovules; style single or more or less divided into 2 entire or 2-fid branches or styles. Fruit either a capsule opening in 2, 3 or 4 or twice as many valves, leaving the dissepiments attached to the axis, or opening transversely, or bursting irregularly, or succulent and indehiscent. Seeds with a small quantity of mucilaginous albumen or without any; cotyledons usually very much folded, rarely straight or imperceptible.—Herbs, often twining or rarely shrubs, woody twiners or even trees, or (in *Cuscuta*) leafless twining parasites. Leaves alternate. Inflorescence various, usually axillary and more or less cymose or peduncles 1-flowered. Bracts and bracteoles usually small or deciduous, rarely large and persistent. Flowers often large and showy, rarely very small.

A considerable Order, widely spread over almost every part of the globe, but most abundant in warm countries

TRIBE I **Convolvuleæ**.—*Corolla-limb plaited or induplicate in bud.*

\**Fruit indehiscent.*

Stigma large, globose, subsessile . . . . .	1. ERYCIB.
Ovary 4-celled. Style long. Stigmas 2 . . . . .	2. *ARGYREIA.
Ovary 2-celled. Style long. Stigmas 2 . . . . .	3. LETTESOMIA.

\*\**Capsule 2—4-valved, or fragile and breaking up.*

Stigmas 2, globose . . . . .	
Filaments linear or dilated near the base . . . . .	4. IPOMEA.
Filaments with an oblong process near the base . . . . .	5. LEPISTEMON.
Ovary 1-celled. Stigmas short-oblong. Bracts enclosing the calyx. . . . .	6. CALYSTEGIA.
Ovary 2-celled. Style 1. Stigmas short-oblong . . . . .	7. CONVULVULUS.
Stigmatic lobes 4 to 8, or rarely 2. Ovary 2-celled, with 1 ovule in each cell . . . . .	8. POLYMERIA.
Ovary 2-celled. Styles 2, each with 2 linear stigmas . . . . .	9. EVOLVULUS.
Styles 2, or 1 deeply 2-partite. Stigmas capitate . . . . .	10. BREWERIA.

TRIBE II. **Dichondreæ**.—*Corolla plicate or induplicate in the bud. Ovary deeply 2—4-lobed.*

Corolla lobes induplicate. Ovary 2-lobed, 2-ovulate . . . . .	11. DICHONDRA.
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TRIBE III. **Cresseæ**.—*Corolla-lobes imbricate in bud.*

Leaves small, sessile. Sepals distinct. Styles 2 . . . . .	12. CRESSA.
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TRIBE IV. **Cuscutææ**.—*Leafless, yellowish, twining parasites.*

Corolla small, campanulate or ovoid . . . . .	13. CUSCUTA.
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1. **ERYCIBE**, Roxb.

(Probably from the Malabar name "Erima-Tali.")

Corolla with a short tube, the limb spreading, of 5 deeply 2-lobed divisions, the lobes in the bud closely folded over each other, the divisions themselves contorted-imbricate. Ovary 1-celled, with 4 erect ovules; stigma sessile, large and thick, divisible into 2, but unmarked outside with 5 or 10 angles or furrows (the result of the impression of the folds of the corolla or of the stamens in the bud). Fruit an indehiscent berry, containing usually a single seed.—Tall, woody evergreen climbers. Leaves entire. Flowers small, in short dense racemes, cymes or clusters, either all axillary or the upper ones in a terminal leafless panicle.

The genus consists of very few species, very nearly allied to each other, spread over tropical Asia.

1. **E. paniculata** (flowers in panicles), *Roxb.: Pl. Corom.* ii. 31 t. 159; *Benth. Fl. Austr.* iv. 411. A very tall woody climber, the young branches under side of the young leaves and inflorescence more or less rusty-tomentose or villous, the adult foliage glabrous or nearly so. Leaves shortly petiolate, oval-elliptical, more or less acuminate, entire, coriaceous, mostly 3 to 4 in. long. Flowers yellow, in short dense racemes or compact panicles, the lower ones often axillary and much shorter than the leaves, the upper ones forming, in the few Australian specimens seen, a small narrow terminal panicle, which, in the Indian ones, is usually large and much branched. Sepals orbicular, a little more than 1 line long, hairy outside. Corolla-tube scarcely so long as the sepals; limb spreading to 3 or 4 lines diameter, pubescent outside, the divisions deeply and broadly 2-lobed. Filaments attached to the base of the tube; anthers ovoid, acuminate, with rather long points. Berry in the Indian specimens ovoid, above  $\frac{1}{2}$  in. long.—*DC. Prod.* ix. 464; *Wight, Illustr.* t. 180; *Rheede, Hort. Mal.* vii., t. 39.

Hab.: Rockingham Bay, *J. Dallachy* (without fruit).

Widely spread over E. India and the Archipelago, and including probably some other described species, the differential characters in the whole genus being as yet very vague and uncertain.—*Benth.*

Var. *coccinea*, *Bail. Bot. Bull.* viii. "Nangbro," *Cairns, E. Cowley*. I find the colour of berry is very seldom recorded in the descriptions given of the species or varieties of this genus; but in all cases where the berries of *E. paniculata* are spoken of they are said to be black, thus differing from this variety, in which they are, when fresh, described as of a pleasing cardinal-red colour; and they were quite red when they reached my hands from Cairns. In form oval, about  $\frac{1}{2}$  to nearly  $\frac{3}{4}$  in. long, rather fleshy, containing a single seed. Hab.: Kamerunga, *Miss Cowley*.

2. **ARGYREIA**, Lour.

(From the silvery covering of plants.)

Scandent rarely sub-erect shrubs. Leaves from cordate-ovate to narrow-lanceolate, silky-hirsute or pubescent. Cymes sessile or pedunculate, capitate or corymbose. Flowers showy, purple or rose, rarely white. Sepals from orbicular to lanceolate, subequal, or the inner smaller, appressed to the fruit, often somewhat enlarged. Corolla funnel-shaped; limb plaited, very shortly lobed. Stamens included; anthers oblong, never twisting. Ovary completely 4-celled, 4-ovuled; disk annular, often prominent, as long as the ovary; style filiform; stigmas 2, sessile, globose. Fruit indehiscent, baccate or dry, hard or papery, 4 to 1-seeded.—*Hook. Fl. of Brit. Ind.* iv. 184.

1. **A. speciosa** (beautiful), *Sweet. Hort. Brit. ed.* ii. 373. An extensive climber, stems stout, white-tomentose. Leaves 6 to 12 in. diameter, ovate-cordate, acute, glabrous above, persistently white-tomentose beneath, petioles long. Peduncles stout, 3 to 6 in. long; flowers subcapitate; bracts large, ovate-lanceolate, acute, thin, softly woolly, deciduous; corolla 2 or 3 in. long,

tubular, funnel-shaped, rosy, woolly. Fruit  $\frac{3}{4}$  in. in diameter, globose, apiculate, brown-yellow, nearly dry.—Hook. Fl. of Brit. Ind. iv. 185; Wight, Ic. t. 851; *Lettsomia speciosa* and *L. nervosa*, Roxb.; *Ipomœa speciosa*, Blume, Bot. Mag. 2416.

Hab.: India and Java. Met with as a stray from garden culture in Queensland.

### 3. LETTSOMIA, Roxb.

(After John Coakley Lettsom, M.D., F.S.A.)

Sepals orbicular, elliptic, or oblong, in fruit often somewhat thickened or enlarged. Corolla tubular funnel-shaped; limb plicate, lobes usually shallow. Stamens included or exserted; anthers oblong or linear, never twisting. Ovary 2-celled, 4-ovuled; disk annular, usually prominent; style filiform; stigmas 2, subsessile, globose. Fruit indehiscent. Seeds 4 or 1. Scandent more or less hairy shrubs. Leaves alternate, undivided, base often rounded or cordate. Cymes axillary, peduncled, densely corymbose or capitate, bracteate.—C. B. Clarke in Hook. Fl. Brit. Ind. iv. 191.

1. **L. Soutteri** (after Wm. Soutter), *Fail. 3rd Suppl. Syn. pl. Fl.* A climbing plant with white silvery terete or nearly terete stems. Leaves from oblong-lanceolate and  $2\frac{1}{2}$  in. long, to ovate-cordate and exceeding 6 in. in length, and more or less acuminate, upper surface glabrous and green, under surface silvery white, the primary veins prominent on both sides, 7 to 9 pairs, petioles 1 to  $2\frac{1}{2}$  in. long, grooved. Peduncles about as long as the petioles, bearing a head of few white-coloured flowers; bracts ovate, densely clothed with long silky hairs. Sepals about  $\frac{1}{4}$  in. long, ovate, glabrous on the inner surface, silky on the outer. Corolla about 1 in. long, the diameter of expanded flower rather above 1 in., lobed more than half-way down, lobes silky-hairy except the infolded margins. Stamens much shorter than the lobes of the corolla, hairy at the base. Disk prominent.

Hab.: Johnstone River.

This plant was received by Mr. William Soutter, the late manager of the Queensland Acclimatisation Society, in 1886, attached to the stem of a fern-tree from the Johnstone. I place it in the above genus from the ovary examined (only one flower seen) appearing rather 2 than 4-celled.

### 4. IPOMŒA, Linn.

(From *ipo*, bindweed, *omoios*, similar; resembling the *Convolvulus*.)

(*Pharbitis*, *Batatas*, *Calonyction*, *Quamoclit*, *Aniseia*, and *Skinneria*, *Chois.*)

Corolla campanulate or with a cylindrical tube; the limb spreading, entire, angular or rarely deeply lobed, folded in the bud. Ovary 2 or 3-celled, with 2 ovules in each cell, or more or less perfectly 4-celled by the addition of a spurious dissepiment between the ovules. Style filiform; stigma capitate, entire, or with 2 short globular or rarely almost ovate lobes. Fruit a dry capsule.—Twining prostrate creeping or rarely low and erect herbs or woody climbers. Leaves entire lobed or divided into distinct segments or leaflets. Flowers often large and showy, axillary, solitary or in dichotomous cymes or rarely in irregular racemes.

A large genus, dispersed over all warm climates, very few species being found without the tropics, either in the New or the Old World.

The distribution of the numerous species into distinct genera has been frequently attempted, but has been practically unsuccessful. The separation of the species with a hypocateriform corolla and exserted stamens is perhaps the most definite, but a very unnatural one, as it would associate *I. Bona-nox* with *I. Quamoclit*. *Pharbitis* with a 3-merous pistil, is quite as artificial, as it would include *I. dissecta* with *I. hederacea* and its allies, besides that the character is sometimes inconstant in the same species. The spurious dissepiments of *Batatas* are often very imperfect or disappear altogether. The ovary of *Skinneria* is not 1-locular, as had been supposed, although the dissepiment dries up as the fruit enlarges. The inequality of the sepals in



some species of *Aniseia* is not greater than in several species retained in *Ipomœa*. The spiral twisting of the anthers after emitting their pollen, so characteristic of some of the large-calyxed species is but slight or uncertain in others. And notwithstanding great differences in the form of the corolla, in the dehiscence of the capsule, and indumentum of the seeds, no good natural groups founded upon any of these characters have as yet been proposed. As a whole, the genus *Ipomœa* itself can scarcely be said to be a very well marked nor a very natural one; it is distinguished from *Argyreia* by the dry capsular fruit usually, but not always, opening in valves, and from *Convolvulus* only by the globular or orbicular stigma or stigmatic lobes. The series of species here proposed are too artificial, and not always sufficiently distinct, to be given as sections, but they are the best I have been able to frame for the determination of the Australian species.—*Benth.*

**SERIES I. *Digitata*.**—*Leaves digitately divided into deep lobes or distinct segments or leaflets. Flowers of the Speciosæ, or rarely of the Campanulata.*

- Leaves palmately or almost pedately several-lobed. Flowers large in loose cymes . . . . . 1. *I. digitata*.  
 Stem glabrous or slightly hairy. Leaves ovate-cordate, acute-angular or more or less lobed. Flowers about 2 in. diameter . . . . . 2. \**I. Batatas*.  
 Leaves divided into 5 or 7 ovate or lanceolate entire segments. Flowers large. Plant glabrous or hairy.  
 Sepals nearly equal. Seeds pubescent or hairy. Leaf-segments usually confluent at the base . . . . . 3. *I. palmata*.  
 Inner sepals nearly twice as large as the outer ones. Seeds glabrous. Leaf-segments quite distinct . . . . . 4. *I. quinata*.  
 Leaves divided into 3 to 7 linear usually pinnatifid segments.  
 Corolla nearly 2 in. long. (Ovary 2-celled?) . . . . . 5. *I. diversifolia*.  
 Corolla scarcely  $\frac{1}{2}$  in. long. Ovary 3-celled . . . . . 6. *I. dissecta*.  
 Leaves palmate; leaflets narrow-lanceolate, toothed or pinnatifid. Flowers white or purple,  $1\frac{1}{2}$  in. diameter . . . . . 7. *I. sinuata*.

**SERIES II. *Pharbitides*.**—*Leaves entire or 3-lobed. Ovary usually 3-celled. Sepals usually long and narrow. Corolla of the Speciosæ.*

- Calyx acuminate, above  $\frac{1}{2}$  in. long.  
 Leaves mostly 3-lobed. Flowers few on the peduncle. Calyx hairs usually spreading . . . . . 8. *I. hederacea*.  
 Leaves mostly entire. Flowers usually several in a compact cyme. Hairs usually appressed . . . . . 9. *I. congesta*.  
 Calyx scarcely acuminate, under  $\frac{1}{2}$  in. long. Leaves mostly entire . . . . . 10. \**I. purpurea*.  
 Perennial twiner. Leaves 3-lobed. Peduncles bearing a cyme of several large flowers and lanceolate bracts. Corolla violet-blue, with 5 purple rays . . . . . 11. \**I. Learii*.

**SERIES III. *Calycina*.**—*Leaves entire or lobed at the base. Ovary 2-celled. Sepals large, obtuse (attaining  $\frac{2}{3}$  to 1 in. after flowering). Corolla large ( $1\frac{1}{2}$  to 3 in. long).*

- Glabrous or nearly so. Bracteoles small. Sepals very large. Corolla broadly campanulate, about 2 in. long.  
 Leaves large, mostly peltate . . . . . 12. *I. peltata*.  
 Leaves cordate or lanceolate-oblong. Corolla nearly 3 in. broad . . . . . 13. *I. calobra*.  
 Leaves cordate or hastate, acuminate. Petioles and peduncles often winged . . . . . 14. *I. alata*.  
 Pubescent. Bracteoles large, membranous, deciduous. Corolla campanulate,  $1\frac{1}{2}$  in. long or rather more . . . . . 15. *I. Turpethum*.  
 Glabrous or sparingly pubescent. Bracteoles small. Corolla about 3 in. long, contracted into a tube at the base. Leaves acuminate. Outer sepals rather larger than the others . . . . . 16. *I. grandiflora*.  
 Stems smooth or muricate. Leaves cordate-ovate, acute, entire or angular or lobed. Peduncles long, 1–5-flowered. Corolla large, white, tube long. Seeds glabrous . . . . . 17. \**I. bona-nox*.

**SERIES IV. *Speciosæ*.**—*Leaves entire toothed or lobed at the base. Ovary 2-celled or spuriously 4-celled. Sepals moderate or small (rarely attaining  $\frac{1}{2}$  in.) Corolla large ( $1\frac{1}{2}$  to 3 in. long), often more or less tubular at the base, usually pink purple or white.*

- Stems prostrate or creeping and rooting at the lower nodes. Maritime plants. Seeds woolly-hairy.  
 Leaves rather thick, very obtuse or emarginate. Ovary more or less 4-celled.  
 Leaves broad, 2 to 3 in. long, the veins prominent . . . . . 18. *I. Pes-capree*.  
 Leaves small or narrow, the veins scarcely prominent . . . . . 19. *I. carnosa*.  
 Leaves rather thin. Ovary 2-celled.  
 Leaves acute or acuminate. Seeds woolly-hairy . . . . . 20. *I. reptans*.

- Leaves obtuse or acute. Seeds glabrous . . . . . 24. *I. denticulata*.  
 Stems twining (sometimes creeping in *I. denticulata*).  
 Corolla  $2\frac{1}{2}$  to above 3 in. long.  
 Leaves linear-lanceolate, not cordate. Stems slender . . . . . 21. *I. graminea*.  
 Leaves broadly ovate-cordate. Stems woody at the base.  
 Pubescent or villous . . . . . 22. *I. velutina*.  
 Glabrous . . . . . 23. *I. abrupta*.  
 Corolla  $1\frac{1}{2}$  to 2 in. long or scarcely more. Leaves cordate or hastate.  
 Peduncles usually much shorter than the rather long pedicels.  
 Sepals obtuse or mucronate. Leaves mostly obtusely auriculate . . . . . 24. *I. denticulata*.  
 Sepals acuminate. Leaves mostly hastate . . . . . 25. *I. gracilis*.  
 Peduncles mostly longer than the short pedicels. Leaves cordate.  
 Corolla above 1½ in. long. Seeds glabrous . . . . . 26. *I. sepiaria*.  
 Corolla scarcely 1½ in. long. Seeds villous . . . . . 27. *I. Muelleri*.

SERIES V. **Campanulatæ**.—Leaves entire toothed or lobed at the base. Ovary 2-celled. Corolla moderate or small (rarely exceeding 1 in.), usually broadly campanulate, yellow white or pink.

- Stems twining. Flowers several together in pedunculate cymes or racemes, the pedicels usually short.  
 Leaves cordate-ovate or lanceolate. Cymes many-flowered. Sepals obtuse, coriaceous. Corolla 1 in. long, white. Capsule acuminate . . . . . 28. *I. cymosa*.  
 Leaves narrow, not cordate. Racemes or cymes loose, few-flowered.  
 Sepals acute. Corolla small, yellow. Capsule 1-celled . . . . . 29. *I. linifolia*.  
 Leaves cordate. Cymes dense or few-flowered. Sepals obtuse. Corolla yellow. Capsule globose, at length rugose.  
 Sepals squarrose. Corolla small. Seeds pubescent . . . . . 30. *I. chryseides*.  
 Sepals not squarrose. Corolla nearly 1 in. long. Seeds glabrous . . . . . 31. *I. flava*.  
 Stems twining. Flowers solitary or rarely 2 or 3 together, the peduncles and pedicels mostly longer than the calyx.  
 Leaves petiolate.  
 Leaves cordate, ovate, entire. Sepals small, obtuse . . . . . 32. *I. obscura*.  
 Leaves ovate-lanceolate, deeply toothed or lobed below the middle.  
 Sepals narrow, acute . . . . . 33. *I. incisa*.  
 Leaves oblong or linear, not cordate, entire. Sepals large, acute, the outer ones broad and decurrent . . . . . 34. *I. uniflora*.  
 Leaves sessile, narrow, toothed at the base or hastate . . . . . 35. *I. angustifolia*.  
 Stems twining. Flowers small, solitary or several together, sessile or with very short peduncles and pedicels. Leaves from cordate to lanceolate.  
 Pedicels mostly about as long as the calyx. Capsule glabrous . . . . . 36. *I. plebeia*.  
 Flowers nearly sessile. Capsule pubescent or villous . . . . . 37. *I. eriocarpa*.  
 Stems erect or ascending, not twining. Leaves not cordate, usually narrow.  
 Flowers small.  
 Plant hairy. Leaves entire toothed or lobed. Flowers nearly sessile . . . . . 38. *I. heterophylla*.  
 Plant tomentose or densely villous. Leaves entire. Flowers solitary or in small cymes on a more or less elongated peduncle . . . . . 39. *I. erecta*.

SERIES VI. **Hypocrateriformes**.—Leaves entire or pinnatifid. Ovary 2-celled or spuriously 4-celled. Corolla with a cylindrical narrow tube, and spreading nearly flat limb.

- Stems twining.  
 Leaves entire or lobed. Flowers red orange or yellow. Ovary 4-celled . . . . . 40. \**I. coccinea*.  
 Leaves pinnatifid, with linear-subulate lobes. Flowers red or white.  
 Ovary 4-celled . . . . . 41. \**I. Quamoclit*.  
 Stems twining, silky. Leaves cordate, entire or 3-lobed. Peduncles 3-flowered. Involucre of several linear bracts long as the calyx . . . . . 42. *I. cataractæ*.

1. ***I. digitata*** (finger-leaved), *Linn.*; *Meissn. in Mart. Fl. Bras.* vii. 278. Stems trailing or twining sometimes to a great length, the whole plant glabrous. Leaves palmately or almost pedately divided to below the middle into 5 to 9 ovate-lanceolate obtuse or acuminate lobes, the whole leaf often 6 to 10 in. long and broad. Peduncles longer than the petiole and sometimes 8 to 10 in. long, bearing a cyme of several large purple or pink flowers. Sepals broad, very obtuse, 3 to 4 lines long. Corolla campanulate, shortly tubular at the base, 2 in. long or more, pink-purple. Anthers large, undulate but scarcely twisted. Ovary 2-celled or more or less 4-celled by spurious dissepiments between the seeds especially at the top. Capsule ½ in. diameter or even larger. Seeds densely woolly-villous.—*I. paniculata*. R. Br. *Prod.* 486; *Benth. Fl. Austr.* iv. 415;

Bot. Reg. t. 62; *Batatas paniculata*, Chois. Conv. Or. and in DC. Prod. ix. 389; *I. insignis*, Andr. Bot. Rep. t. 636; Bot. Reg. t. 75; Bot. Mag. t. 1790 (a form with less deeply divided leaves, which occurs also in Australia); *I. plantensis*, Bot. Mag. t. 3685.

Hab.: Cape York, *Jardine*; Palm Island, *Banks and Solander*; Port Molle, *McGillivray*; Rockingham Bay, *Dallachy*.

A maritime plant, not uncommon on the coasts of tropical Asia, Africa, and America.

2. \***I. Batatas** (original name of the Sweet Potato), *Lam.*; *Clarke in Hook. Fl. Brit. Ind.* iv. 262. Sweet Potato. A glabrous or sparingly hairy tuberous plant. Tubers red, white or yellow. Leaves ovate-cordate, acute, angular, or more or less lobed. Peduncles long, many-flowered. Sepals elliptic, shortly acute, glabrous. Corolla 2in. diameter, and purple upwards. Ovary 4-celled. Capsule 4-celled, or by suppression 3 to 1-celled.—*Convolvulus Batatas*, Linn.; *C. edulis*, Thunb.; *C. esculentus*, Salisb.; *Batatus edulis*, Chois.; *B. santhorhiza*, Bojer. Hort. Maurit. 225; Rumph, Herb. Amb. v, t. 130; Rheede, Hort. Mal. vii. t. 50.

Hab.: America. Found as a stray from cultivation.

3. **I. palmata** (leaves palmate), *Forsk.*; *Chois. in DC. Prod.* ix. 386; *Benth. Fl. Austr.* iv. 415. A glabrous twiner, the old stems often more or less tuberculate or muricate. Leaves digitately divided nearly or rarely quite to the base into 5 to 7 ovate-lanceolate lanceolate or oblong lobes, obtuse or rarely acute, 1 to 2in. long. Peduncles usually several-flowered and as long as or longer than the petioles; pedicels rather long. Sepals broad, obtuse, 3 to 4 lines long, all nearly equal. Corolla purple, pink or white, campanulate, but contracted into a tube towards the base,  $1\frac{1}{2}$  to 2in. long, the angles or short broad lobes generally terminating in acute points. Ovary 2-celled. Capsule globular, as long as the calyx. Seeds pubescent and usually bordered by long silky hairs.—*I. pendula*, R. Br. Prod. 486; Andr. Bot. Rep. t. 613; Bot. Reg. t. 632; Chois. in DC. Prod. ix. 387, with most of the synonyms adduced (but not *I. Horsfallia*, Hook.): *I. pulchella*, Roth, and *I. tuberculata*, Rœm. and Schult., Chois. in DC. Prod. ix. 386, with most but not all of the synonyms adduced.

Hab.: Rockingham Bay, *F. v. Mueller*; Moreton Bay, *Fraser, F. v. Mueller*; Ipswich, *Nerst*; Rockhampton, *O'Shanessey*; Edgecombe Bay, *Dallachy*; Mackenzie Island, *Thozet*; Curtis Island, *Henne*.

The species is widely dispersed over tropical Asia, Africa, and America.

4. **I. quinata** (leaf-segments 5), *R. Br. Prod.* 486; *Benth. Fl. Austr.* iv. 415. A rather slender twiner, glabrous or the stems and foliage more or less hirsute with long spreading hairs. Leaves digitate, with 5 distinct lanceolate or narrow-oblong obtuse entire segments, 1 to  $1\frac{1}{2}$ in. long, contracted at the base. Peduncles usually 1-flowered and shorter than the leaves. Sepals ovate, the outermost about 3 lines long, the innermost nearly or quite twice as long. Corolla white or pale-pink, campanulate but contracted into a tube towards the base, nearly 2in. long, very shortly and broadly lobed or angled. Ovary 2-celled. Capsule  $\frac{1}{2}$ in. long, somewhat acuminate. Seeds glabrous.—Chois. in DC. Prod. ix. 385; *I. hirsuta*, R. Br. Prod. 486; *I. pentadactylis*, Chois. Conv. Or., and in DC. Prod. ix. 385; *Convolvulus quinatus*, Spreng. Syst. i. 590.

Hab.: Cape York and Port Molle. *McGillivray*; Rockingham Bay, *J. Dallachy*.

The species is also in Burmah and S. China.

5. **I. diversifolia** (leaves various), *R. Br. Prod.* 487; *Benth. Fl. Austr.* iv. 416. Stems very slender, trailing or twining, glabrous as well as the foliage. Leaves digitate, with very narrow linear segments, entire or more frequently toothed or pinnatifid, the central one 1 to 2in. long, the others much shorter.

Peduncles rather short and thick, mostly 1-flowered. Sepals oblong-lanceolate, acute, nearly equal or the inner ones rather longer. Corolla nearly 2in. long, contracted into a tube towards the base. Capsule glabrous, globular, nearly as long as the calyx.—*Convolvulus diversifolius*, Spreng. Syst. i. 592.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

The leaves are not unlike those of the slender forms of *I. dissecta*, to which Choisy refers it, but the flowers are totally different.—*Benth*.

6. ***I. dissecta*** (leaves much divided), *Willd. Phytogr.* 5, t. 2; *Benth. Fl. Austr.* iv. 416. Stems annual, slender, trailing or twining, glabrous as well as the foliage. Leaves digitate, with 3, 5 or rarely 7 linear or linear-cuneate segments, acute and once or even twice pinnatifid and toothed. Peduncles 1 or rarely 2-flowered, short, but said to be often longer than the leaves in Indian specimens. Sepals ovate or lanceolate, obtuse or shortly acuminate, all nearly equal, 2 to 2½ lines long, often mucronate on the midrib. Corolla white, campanulate, about twice as long as the calyx. Anthers oval-oblong, slightly twisted when fading. Ovary 3-celled; stigma capitate, 3-lobed.—*R. Br. Prod.* 487; Choisy in DC. *Prod.* ix. 363 (partly); *I. optica*, Roth; Choisy in DC. *Prod.* ix. 384.

Hab.: Burdekin River, *Bowman*; Norman River, *T. Gulliver*; Einasleigh River, *W. E. Arnitt*.

The species extends over tropical Asia and Africa.

7. ***I. sinuata*** (leaves sinuate), *Ortega. Dec.* 84; *Clarke in Hook. Fl. Brit. Ind.* iv. 214; *F. v. M. Fragm.* viii. 17. A tall twiner, having the branches petioles and peduncles very hairy or glabrous. Leaves palmate, glabrous or nearly so, 2 to 4in. diameter; leaflets narrowly lanceolate, toothed or pinnatifid; the midrib sometimes hirsute. Peduncles 1 to 2-fid. Sepals nearly 1in. long, elliptic-oblong, glabrous. Corolla 1½in., campanulate, white with purple throat. Capsule 4 to 6 lines diameter, glabrous, 2-celled, normally 4-seeded. Seeds 3 lines diameter, glabrous or nearly so.

Hab.: Peak Downs, *A. Thozet*, and Bowen River, *Robert Fitzgerald* (F v. M.)

A native of tropical America, widely spread in the Old World.

8. ***I. hederacea*** (Ivy-like), *Jacq. Collect.* i. 124; *lc. i. t.* 36; *Benth. Fl. Austr.* iv. 416. A tall herbaceous twiner, more or less hirsute, the hairs of the stem reflexed. Leaves petiolate, broadly cordate, more or less 3 or 5-lobed, the lobes acuminate, the middle one broad or narrow (but not linear), contracted or dilated at the base, the lateral ones shorter and broader, the whole leaf from 1½ to 4in. long. Peduncles short or rarely longer than the petioles, with 2 or 3 nearly sessile flowers at the end. Bracts linear. Sepals lanceolate, acuminate, broader and hispid with long hairs at the base, from ½in. to nearly 1in. long. Corolla blue or purple, often above 2in. long. Ovary almost always 3-celled.—*R. Br. Prod.* 486; *Bot. Reg. t.* 85; *I. nil*, Roth, *Catal. Bot.* i. 36; *Pharbitis nil* and *hederacea*, Choisy. *Conv. Or.* and in DC. *Prod.* ix. 343, 344, with most, if not all, of the synonyms quoted; *Convolvulus nil*, Linn., *Bot. Mag. t.* 188.

Hab.: Booby Island, *Banks and Solander*; Cleveland Bay, *Johnson*; Sattor and Burdekin Rivers, *Leichhardt, Bowman*; Cape and Flinders Rivers, *Bowman*; Rockingham Bay, *Dallachy*; Gilbert River, *R. Daintree*; Rockhampton, *Thozet*; Moreton Bay, *Backhouse*.

Var. *umbata*, Hook. f. *Bot. Mag. t.* 5720. Flowers of a deep-blue, with a pale or white margin. *Pharbitis umbata*, Lindl. in *Journ. Hort. Soc.* v. 33; Henfr. in *Gard. Mag. Bot.* ii., with a fig., copied into *Fl. des Serres*, t. 608, and *Lem. Jard. Fleur.* t. 97.

The species is common in most tropical and subtropical regions of the New as well as the Old World, in some places, perhaps, escaped from cultivation.—*Benth*.

Seeds said to be a quick and effective cathartic. In India known by the name "Kala-dana" (black seed). The seeds are roasted like coffee, powdered, and administered in doses of from 30 to 40 grains in any convenient vehicle.

9. **I. congesta** (flowers crowded), *R. Br. Prod.* 485; *Benth. Fl. Austr.* iv. 417. A tall hirsute twiner, nearly allied to *I. hederacea*, but generally larger and the hairs less spreading. Leaves broadly cordate-ovate, acuminate, entire (or obscurely 3-lobed?), usually 3 to 4in. long. Peduncles longer than in *I. hederacea*, bearing a dense cyme of 3 or more large blue purple or pink flowers. Sepals lanceolate, acuminate,  $\frac{3}{4}$ in. long. Corolla nearly 3in. long. Ovary 3-celled.—*Chois. in DC. Prod.* ix. 369; *Convolvulus congestus*, Spreng. Syst. i. 601; *Pharbitis insularis*, *Chois. Conv. Or.* and in *DC. Prod.* ix. 341.

Hab.: Endeavour River, *Banks and Solander*; Rockingham Bay, *J. Dallachy*; Lady Elliott's Island. *A. Thozet*.

Also in Norfolk Islands and in the islands of the S. Pacific.

10. \***I. purpurea** (purple), *Roth, Catal.* i. 36; *Benth. Fl. Austr.* iv. 417. Stems twining, more or less hirsute, with reflexed hairs or rarely glabrous. Leaves cordate-ovate, acuminate, entire or very rarely somewhat 3-lobed, glabrous or the petioles and veins pubescent, nearly 2 to 4in. long. Peduncles longer than the petioles, bearing 1, 2 or 3 pedicellate flowers. Bracts small and narrow. Sepals lanceolate, scarcely acuminate, under  $\frac{1}{2}$ in. long, mostly hairy at the base. Corolla often above 2in. long, purple blue pink or rarely white or variegated, campanulate, more or less tubular towards the base. Ovary 3-celled.—*Convolvulus purpureus*, Linn.; *Bot. Mag.* t. 113, 1005, 1682; *Pharbitis hispida*, *Chois. Conv. Or.* and in *DC. Prod.* ix. 341.

Hab.: An American species, found near all settlements as a stray from garden culture.

11. \***I. Learii** (after J. G. Lear), *Past. Mag. of Bot.* vi. A perennial hairy twiner. Leaves 3-lobed, 3 to 5in. long, underside pale. Peduncles axillary, longer than the leaves, bearing a cyme of several flowers accompanied by linear-lanceolate bracts. Calyx hairy. Sepals erect, linear-lanceolate. Corolla lilac in the bud, expanded limb 4 or 5in. diameter, of a rich violet-blue, with 5 purple rays. Stamens unequal, included. Style long as the tube. Ovary 3 or 4-celled surrounded by a 5-lobed disk. Stigma granulated.—*Pharbitis Learii*, Lindl. *Bot. Reg.* 1841, t. 56; *Bot. Mag.* t. 3928.

Hab.: Buenos Ayres. Naturalised near townships.

12. **I. peltata** (leaves peltate), *Chois. Conv. Or. and in DC. Prod.* ix. 359; *Benth. Fl. Austr.* iv. 418. A tall woody twiner, with a milky juice (*Seemann*), covering whole trees with its dark green foliage (*Dallachy*), quite glabrous or the veins of the leaves hairy underneath. Leaves broadly ovate, shortly acuminate, more or less peltate or the upper ones cordate with a narrow sinus, 6 to 10in. long. Flowers large, usually white, in loose cymes on a common peduncle usually shorter than the petiole. Sepals broad, obtuse, coriaceous, nearly equal, about  $\frac{1}{2}$ in. long when in flower. Corolla broadly campanulate, at least 2in. long. Anthers large, glabrous (woolly according to *Choisy*). Fruit not seen.

Hab.: Rockingham Bay, *Dallachy*.

Also in the Mascarene Islands, in the Indian Archipelago, and in the islands of the S. Pacific. The flowers are white, according to *Dallachy* and *Seemann*, white or purplish according to *Desrousseaux* (*Lam. Dict.* iii. 672), sulphur-coloured according to *Bume*, yellow according to *Choisy*.—*Benth.*

13. **I. calobra** (an aboriginal name), *Hill and F. v. M. Fragm.* xi. 73 and 137. "Calobra," Barcoo, *Hill*; "Weir," Moonie and Balonne Rivers, *Fitzgerald* (*F. v. M.*). A tall twiner from a large often somewhat turnip-shaped tuber. Leaves cordate or lanceolate-oblong, often exceeding 4in. broad, glabrous, entire, the lateral nerves rather distant. Sepals exceeding  $\frac{1}{2}$ in. long, broadly ovate, obtuse, glabrous. Corolla nearly 3in. broad, reddish at the centre, paler outwards. Stamens short, inserted near the base of the corolla-tube, hairy at the base.

Anthers narrow, at last spirally twisting. Style capillary, glabrous, short. Capsule globose-ovate, attenuating to a point, about 1in. long, 4-valved, 2-celled, 4-seeded. Seeds glabrous, dark-brown, about  $\frac{1}{2}$ in. long, elliptic, 3-angular and smooth.

Hab.: Mulga scrubs, Barcoo River, *W. Hill*; Moonie and Balonne Rivers, *R. Fitzgerald* (F. v. M.)

14. ***I. alata*** (winged), *R. Br. Prod.* 484; *Benth. Fl. Austr.* iv. 418. A tall twiner, quite glabrous. Leaves petiolate, cordate-ovate or ovate-lanceolate, acuminate with the point usually long and fine, sometimes angular or lobed at the base, 3 to 4in. long, the petiole often winged. Peduncles rather longer than the petiole, often winged, bearing each a single rather large white flower. Sepals very broad, obtuse, coloured, nearly 1in. long at the time of flowering. Corolla campanulate, about 2in. long. Capsule globose, about 1in. diameter, bursting irregularly. Seeds glabrous.—*Chois. in DC. Prod.* ix. 369; *Convolvulus alatus*, *Spreng. Syst.* i. 596.

Hab.: Thursday Island. Specimens of a dead plant, which I believe to be this species.

The S. American *I. altissima*, Mart., and the Central American *I. codonantha*, Benth., cannot in the dried state, when in flower, be distinguished from *I. alata*. There may, however, be differences in the seeds, and we have no similar species either from Asia or Africa.—*Benth.*

15. ***I. Turpethum*** (from "Turbitb," the Arabic name of the root used as a drug), *R. Br. Prod.* 485; *Benth. Fl. Austr.* iv. 418. "Kar-kor," *Cloncurry, Palmer*. A tall twiner, the young parts, foliage, and inflorescence softly pubescent, the old stems often bordered by narrow longitudinal wings. Leaves petiolate, mostly broadly cordate-ovate and acuminate, but sometimes obtuse or angular at the base, 2 to 4in. long, or when luxuriant twice that size. Peduncles usually shorter than the leaves, bearing a short raceme of few rather large white flowers, but sometimes 1-flowered. Bracts ovate, thin, coloured,  $\frac{1}{2}$  to 1in. long, very deciduous. Pedicels at first short and thick, but lengthening to 1in. Outer sepals broadly ovate, often  $\frac{3}{4}$ in. at the time of flowering and lengthening to 1in., the inner ones rather smaller. Anthers large, much twisted when fading. Ovary 2-celled. Capsule much shorter than the calyx, globular, membranous. Seeds glabrous.—*Chois. in DC. Prod.* ix. 360; *Bot. Reg.* t. 279; *Convolvulus Turpethum*, Linn.; *Bot. Mag.* t. 2093; *Wight in Hook. Bot. Misc.* iii. t. Suppl. 88; *I. anceps* and *I. triquetra*, Rœm. and Schult.; *Chois. in DC. Prod.* ix. 360; *Argyrea alulata*, *Miq. Fl. Ind. Bat.* ii. 587.

Hab.: Broadsound, *R. Brown*; Lizard Island, *McGillivray*; Sir Charles Hardy's Island, *Henne*; Suttor River, *Bowman*; Flinders River, *Sutherland*; Rockhampton, *O'Shanesy*.

The species extends from the Mauritius and Ceylon over the peninsula of India, the Himalayas, and the Eastern Archipelago, as far north as Formosa, and is also said to be in the West Indies, probably introduced from Asia.—*Benth.*

16. ***I. grandiflora*** (flowers large), *Lam. Ill.* i. 467; *Clarke in Hook. Fl. Brit. Ind.* iv. 198. A tall twiner, the stems often softly muricate. Leaves petiolate, broadly cordate-ovate, acuminate, entire or somewhat 3-lobed, with rounded auricles, mostly 2 to 4in. long. Peduncles shorter or rather longer than the petioles, bearing 1 or rarely 2 or 3 large (pale purple or pink?) flowers. Bracts very small; pedicels short. Sepals obtuse,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. long, all nearly equal in length, but the outer ones broad and almost cordate at the base, of a much firmer consistence than in *I. Turpethum*, and when in fruit above 1in. long. Corolla 2 $\frac{1}{2}$  to 3in. long, the tube cylindrical at the base but dilated upwards and not nearly so slender as in *I. bona-nox*. Anthers included in the tube. Capsule ovoid or globular,  $\frac{3}{4}$  to 1in. diameter or even larger. Seeds large, minutely silky-pubescent, and usually, but not always, either bordered or covered all over with long woolly hairs.—*I. longiflora*, *R. Br. Prod.*; *Benth. Fl. Austr.* iv. 418;

*I. macrantha*, Rœm. and Sch.; *I. Tuba*, G. Don, Syst. iv. 270; Meissn. in Mart. Fl. Bras. vii. 216; *Calonyction grandiflorum*, Choisy. in DC. Prod. ix. 346; Rheede, Hort. Mal. xi. t. 50.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Burdekin River, the root eaten by the natives, *Bowman*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*.

17. \***I. bona-nox** (good night), *Linn.* Moonflower. An extensive climber, the stem often muricate. Leaves cordate-ovate, glabrous, entire or angular or lobed, 2 to 8 in. long, the petioles 3 to 6 in. Peduncles 2 to 6 in.; bracts caducous. Flowers 1 to 5. Sepals  $\frac{3}{4}$  in. long, usually ovate, obtuse, mucronate or shortly acute; in fruit unaltered or slightly enlarged. Corolla white; tube slender, about 3 in. long; limb 3 to 5 in. diameter, white or plaits greenish. Anthers shortly exerted or subincluded. Capsule narrowed upwards, about 1 in. diameter.—Bot. Mag. t. 752; Meissn. in Mart. Fl. Bras. vii. 215; *Calonyction speciosum*, Choisy. Convolv. Or. 59 t. 1, fig. 4.

Hab.: A native of tropical America, now naturalised in Queensland and other warm countries.

18. **I. Pes-capræ** (goat's foot), *Roth, Nov. Sp. Pl.* 109; *Benth. Fl. Austr.* iv. 419. "Walno-jo," Mt. Cook, *Roth*. A glabrous perennial, with long prostrate creeping or trailing stems. Leaves on long petioles, oval obovate or orbicular, broadly emarginate or very obtusely 2-lobed, rather thick, with nearly parallel oblique veins, the lower ones converging at the base of the leaf, mostly 2 to 3 in. long. Peduncles often as long as the leaves, bearing 1 or 2 rather large pink flowers on rather long pedicels. Sepals obtuse, about 3 lines long or the inner ones rather longer. Corolla broadly campanulate, somewhat tubular at the base, about  $1\frac{1}{2}$  in. long. Ovary more or less perfectly 4-celled, at least at the time of flowering. Capsule 2-celled, ovoid or nearly globular, coriaceous,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Seeds hairy.—*Convolvulus Pes-capræ*, Linn. Spec. Pl. 226; *C. maritimus*, Desr. in Lam. Dict. iii. 550; *Ipomœa maritima*, R. Br. Prod. 486; Bot. Reg. t. 319, and probably all the synonyms adduced by Choisy in DC. Prod. ix. 349, under *I. Pes-capræ* except *I. carnosa*: *I. biloba*, Forsk. Fl. Æg.-Arab. 44; C. B. Clarke in Hook. Fl. Brit. Ind. iv. 212; *Batatas maritima*, Bojer. Hort. Maurit. 224; Rumph. Herb. Amb. v. t. 159, fig. 1; Rheede, Hort. Mal. xi. t. 57.

Hab.: Torres Straits, *F. v. Mueller*; Harvey Bay, Sandy Cape, *R. Brown*; Port Denison, *Fitzalan*; Edgecombe Bay, *Dallachy*; Mackenzie Island, *Sutherland*; Nerang, *Rev. B. Scottichini*; a very common plant on the coastlands.

The species is common on the seacoasts of most tropical countries in the New as well as the Old World. Although placed by Choisy in *Ipomœa*, there is generally a more or less developed, spurious, transverse dissepiment between the ovules and young seeds, subdividing each cell into two.—*Benth.*

Roots eaten after being baked and hammered on stones, *Roth*.

19. **I. carnosa** (fleshy), *R. Br. Prod.* 485; *Benth. Fl. Austr.* iv. 420. A prostrate or creeping glabrous perennial. Leaves petiolate, mostly ovate or oblong, very obtuse or emarginate, cordate at the base, thick and somewhat fleshy, penniveined, and  $\frac{1}{2}$  to 1 in. long, but sometimes with 1 or 2 very prominent basal lobes on each side, and in some specimens (not Australian) long and narrow with a hastate base. Peduncles short, bearing 1 or rarely 2 or 3 rather large white flowers. Sepals rather narrow, 4 to 5 lines long at the time of flowering, subsequently enlarged, the outer ones mucronate-acute, the inner ones obtuse and often rather longer. Corolla campanulate, about  $1\frac{1}{2}$  in. long. Capsule nearly globular, more or less perfectly 4-celled, about  $\frac{1}{2}$  in. diameter, glabrous. Seeds densely woolly-hairy.—*Convolvulus carnosus*, Spreng. Syst. i. 60; *Batatas littoralis* and *B. acetosifolia*, Choisy, in DC. Prod. ix. 337, 338, with most, if not all, of the synonyms adduced; *Convolvulus stoloniferus*, Cyr. Pl. Rar. 14. t. 5: *Ipomœa acetosifolia*, Rœm. and Sch.; Meissn. in Mart. Fl. Bras. vii. 255 t. 94.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

The species is dispersed along the coasts of the warmer regions of Asia, Africa, and America, extending beyond the tropics to the shores of the Mediterranean. Although placed by Choisy in a

different genus from *I. Pes-capræ*, it is very nearly allied to it, differing chiefly in the narrower, more fleshy, and less prominently veined leaf, and the spurious disseminations usually, but not always, more perfect and more permanent in the fruit. Grisebach (Fl. Brit. W. Ind. 471) places it in a section with glabrous seeds, but I have always found them very woolly in American as well as in African and European specimens.—*Benth.*

**20. *I. reptans*** (creeping), *Poir.*: *Chois. in DC. Prod.* ix. 349; *Benth. Fl. Austr.* iv. 420. A glabrous perennial, with long, prostrate, trailing or floating and hollow stems, often rooting at the nodes and sometimes bearing short ascending branches. Leaves on long petioles, from ovate to linear-lanceolate, acuminate, always cordate or hastate at the base, the angles rounded or produced into broad or narrow acute auricles, the leaf usually 2 to 4 in. long, but rarely on the smaller branches a few small ovate-cordate and obtuse ones. Peduncles 1 or few-flowered. Sepals rather obtuse, 3 to 4 lines long. Corolla not so broad as in the two preceding species, more tubular at the base, pink-purplish or white, about 1½ in. long. Filaments hairy at the base. Ovary 2-celled. Capsule globular, coriaceous, apparently indehiscent or bursting irregularly. Seeds large, woolly, often reduced to 2.—*I. aquatica*, Forsk.; Clarke in Hook. Fl. Brit. Ind. iv. 210; Rumph. Herb. Amb. v. t. 155, fig. i., Rheede, Hort. Mal. xi., t. 52.

Hab.: Flinders River, *Sutherland*; Cape River, *Bowman*.

The species is found in marshy or wet sandy places, or floating in water, in many parts of tropical Asia and Africa.

**21. *I. graminea*** (leaves grass-like), *R. Br. Prod.* 485; *Benth. Fl. Austr.* iv. 421. A slender, glabrous twiner. Leaves on short petioles, linear-lanceolate or linear, entire, 4 to 8 in. long. Peduncles 1-flowered, ½ to 1½ in. long (including the pedicel), with very small distant bracts. Sepals oblong, obtuse, ½ in. long or rather more, the outermost one shorter. Corolla 2½ to 3 in. long, contracted into a slender tube.—*Chois. in DC. Prod.* ix. 367; *Convolvulus gramineus*, Spreng. Syst. i. 607.

Hab.: Recorded for Queensland by *F. v. Mueller*.

**22. *I. velutina*** (velvety), *R. Br. Prod.* 485; *Benth. Fl. Austr.* iv. 421. A tall twiner, apparently woody at the base, softly velvety-pubescent or villous all over, the hairs usually reflexed on the branches, often silky on the leaves. Leaves petiolate, broadly ovate-cordate, obtuse or shortly acuminate, entire, 2 to 4 in. long. Peduncles about as long as the petioles or sometimes longer, bearing a dichotomous cyme of several large flowers, rarely reduced to a single flower on the side branches. Bracts very deciduous or none. Sepals broad, very obtuse, glabrous or nearly so, 3 to 4 or even 5 lines long. Corolla fully 3 in. long, contracted into a tube at the base.—*Chois. in DC. Prod.* ix. 369; *Convolvulus velutinus*, Spreng. Syst. i. 601.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Mount Surprise, *W. E. Armit* (F. v. M.)

**23. *I. abrupta*** (abrupt), *R. Br. Prod.* 485; *Benth. Fl. Austr.* iv. 421. A tall woody twiner, glabrous or nearly so. Leaves petiolate, cordate-ovate, obtusely acuminate or almost acute, entire, from 2 or 3 in. long, to twice that size. Flowers large, in pedunculate cymes, rarely reduced on lateral branches to single flowers. Sepals obtuse, coriaceous, 3 to 4 or rarely 5 lines long. Corolla fully 3 in. long, contracted into a tube at the base. Capsule globose, nearly 1 in. diameter. Seeds dark-brown, thinly-velvety.—*Chois. in DC. Prod.* ix. 370; *Fragm.* x. 112; *Convolvulus abruptus*, Spreng. Syst. i. 596.

Hab.: Burdekin River, *Herb. F. Mueller*; Rockingham Bay, *J. Dallachy*; Port Denison, *E. Fitzalan*.

**24. *I. denticulata*** (toothed), *Chois. in DC. Prod.* ix. 379, not of *R. Br.*; *Benth. Fl. Austr.* iv. 421. Glabrous or nearly so; stems rather slender, prostrate and trailing or twining. Leaves petiolate, deeply cordate, ovate, obtuse or acute,



broad or narrow, the basal auricles rounded, with occasionally an acute tooth or angle on the outer side, the whole leaf 1 to 2in. long. Pedicels rather long, often above 1in., solitary or few together on a very short common peduncle, with minute bracts. Sepals obtuse or mucronate, about 4 lines long, coriaceous but often with membranous margins. Corolla  $1\frac{1}{2}$  to nearly 2in. long. Capsule depressed-globular, shorter than the calyx, not wrinkled. Seeds glabrous.—*I. denticulata*, Choix. Fl. Brit. Ind. iv. 208; *I. carnea*, Forst. Prod. 15, not of Jacq.; *I. larigata*, Soland. (not Steud.) in Herb. Banks; *I. littoralis*, Thw. Enum. Pl. Zeyl. 211, not of Blume.

Hab.: Cape York, *Dœmel*; Rockingham Bay, *Dallachy*; Daintree River, *E. Fitzalan* (F. v. M.) Also in Ceylon, the Eastern Archipelago, and in the Society and Sandwich Islands.

25. ***I. gracilis*** (slender), *R. Br. Prod.* 484; *Benth. Fl. Austr.* iv. 422. "Almor-ira," Palmer River, *Roth*. A rather slender twiner, glabrous or scabrous-pubescent. Leaves on long petioles, lanceolate-hastate or triangular-cordate, acute, mostly 1 to 2in. long, the basal lobes or auricles usually acute long and divergent or curved inwards towards the end, but varying in breadth and sometimes but rarely almost obtuse. Peduncles, including the pedicel, as long as the petioles, bearing a single rather large white flower, the bracts very small. Sepals broadly lanceolate, acute or acuminate or rarely obtuse, 4 to 5 lines long or 6 lines when in fruit. Corolla about 2in. long. Capsule globular, smooth, 5 to 6 lines diameter. Seeds shortly pubescent, with a tuft of longer hairs at the hilum.—Choix. in DC. Prod. ix. 370; *Convolvulus gracilis*, Spreng. Syst. i. 604.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Bowen River and Brawl Creek, *Borman*; Rockingham Bay, *Dallachy*; Springsure, *F. v. Mueller*.

Roots roasted and eaten, *Roth*.

26. ***I. sepiaria*** (found in hedges), *Kan.*; Choix. in DC. Prod. ix. 370; *Benth. Fl. Austr.* iv. 422. A twiner, either quite glabrous or the stems hirsute with long spreading or reflexed hairs. Leaves petiolate, broadly cordate-ovate, obtuse or shortly and obtusely acuminate, the basal auricles rounded or angular, mostly 1 to 3in. long. Peduncles rather rigid, longer than the petioles, bearing a dense cyme or cluster of 3 to 5 pink or white flowers on short pedicels. Bracts small, narrow, often persistent. Sepals ovate-lanceolate, acute or mucronate, varying from  $2\frac{1}{2}$  to 4 lines in length, the outer ones often rugose. Corolla about  $1\frac{1}{2}$ in. long. Capsule globular, somewhat depressed, smooth. Seeds glabrous or furred.—Hook. Fl. Brit. Ind. iv. 209; Wight, Ic. t. 838; Rheede, Hort. Mal. xi., t. 53.

Hab.: Cape River, *Borman* (Herb. F. v. M.); Cooper's Creek, *F. v. Mueller*.

The species is dispersed over E. India and the Eastern Archipelago.

27. ***I. Muelleri*** (after Baron Mueller), *Benth. Fl. Austr.* 423. A glabrous rather slender twiner. Leaves on rather long petioles, very broadly cordate-ovate, obtuse, with rounded basal auricles, entire, 1 to 2in. long. Peduncles shorter or at length longer than the petioles, bearing 1 to 3 flowers on very short pedicels. Bracts very small. Sepals broad, obtuse or scarcely acuminate, 4 to 5 lines long. Corolla apparently pink, rather above 1in. long. Capsule globular, smooth, as long as the calyx. Seeds villous.

Hab.: Boulia, *Dr. W. E. Roth*; Cloncurry, *F. v. Mueller*.

Evidently nearly allied to *I. sepiaria*, but the flowers are smaller and the seeds villous.—*Benth.*

28. ***I. cymosa*** (flowers in cymes), *Ram. and Schult.*; Choix. in DC. Prod. ix. 371; *Benth. Fl. Austr.* iv. 423. A rather coarse twiner, glabrous or softly pubescent, usually turning dark brown in drying. Leaves petiolate, from ovate to oblong or lanceolate, shortly acuminate or obtuse, the larger ones broadly cordate or almost sagittate, the narrow ones rounded at the base. Flowers of

a pure white or with a yellow eye, in cymes of 6 to 12 or even more, rarely solitary or nearly so, on a short rather thick common peduncle. Sepals 2 to 3 or in some Indian specimens nearly 4 lines long, glabrous, coriaceous, nearly equal in length. Corolla campanulate, lin. long or even larger, often hairy outside at the top. Ovary 2-celled. Capsule shortly acuminate, longer than the calyx. Seeds clothed with long soft loose hairs.—Bot. Reg. 1843, t. 24; Hook. Fl. Brit. Ind. iv. 211; Rumph. Herb. Amb. v., t. 158.

Hab.: Rockingham Bay, *Dallachy* (sometimes covering the trees with a sheet of white flowers).

The species is common in the greater part of India and the Archipelago, and is scarcely to be distinguished from the *I. umbellata* of tropical America and Africa, except by the colour of the flowers, which, in the latter species, is yellow.—*Benth.*

29. ***I. linifolia*** (Flax-leaved), *Blume; Choisy, in DC. Prod.* ix. 369; *Benth. Fl. Austr.* iv. 423. A slender twiner, glabrous or clothed or sprinkled with long silky hairs. Leaves petiolate, narrow-lanceolate, entire, rounded or truncate at the base, 1 to 2 in. long. Peduncles slender, mostly about as long as the leaves, bearing sometimes a forked cyme, more frequently a simple loose 1-sided raceme of 3 or more yellow flowers, the bracts small but persistent. Pedicels nearly as long as the calyx. Sepals ovate or lanceolate, acute, nearly equal,  $2\frac{1}{2}$  to nearly 3 lines long. Corolla campanulate, about  $\frac{3}{4}$  in. long. Ovary 2-celled, but the dissepiment usually drying up after flowering. Capsule small, smooth, globular, usually 1-celled. Seeds 4, glabrous.—Hook. Fl. Brit. Ind. iv. 205; *Skinneria aspitosa*, Choisy. Conv. Or. t. 6, and in DC. Prod. ix. 435.

Hab.: Rockingham Bay, *Dallachy*.

Common in India and the Eastern Archipelago. I refer this plant to Blume's *I. linifolia*, on the authority of a specimen received from Miquel under that name, which agrees well with Blume's short diagnosis.—*Benth.*

30. ***I. chryseides*** (flowers like the Chryseis or Eschscholtzia), *Ker. Bot. Reg.* t. 270; *Benth. Fl. Austr.* iv. 423. A slender glabrous twiner. Leaves on long petioles, broadly ovate-cordate or almost hastate, acuminate, 1 to 2 in. long, entire or with 2 broad rounded and sometimes toothed basal lobes. Peduncles as long as the leaves or nearly so, with 2 spreading branches, each bearing 2 to 4 small yellow flowers, with 1 in the fork. Sepals 2 to  $2\frac{1}{2}$  lines long, obovate or broadly oblong, truncate or retuse and herbaceous at the end, with a small recurved point in the centre, giving the cyme a squarrose aspect. Corolla broadly campanulate, not twice as long as the calyx. Stamens and style often as long as the corolla or nearly so. Capsule 3 to 4 lines diameter, nearly globular, with 4 raised longitudinal ribs and usually transversely wrinkled when quite ripe. Seeds pubescent.—Choisy. in DC. Prod. ix. 382; Wight, Ic. t. 157; Hook. Fl. Brit. Ind. iv. 206.

Hab.: Rockingham Bay, *Dallachy*.

Common in E. India and the Archipelago.

31. ***I. flava*** (yellow), *F. v. M.; Benth. Fl. Austr.* iv. 424. A rather slender glabrous twiner. Leaves petiolate, cordate-ovate, mostly acuminate, with large rounded or angular basal auricles, or the upper ones lanceolate-sagittate, 1 to 2 in. long. Peduncles rather long, bearing an irregular dense cyme of very few yellow or nearly white flowers on short pedicels or sometimes the flower solitary. Bracts very small. Sepals ovate or oblong, obtuse, rigid but smooth and almost membranous, 3 to 4 lines long. Corolla campanulate, apparently about lin. long. Anthers rather large. Capsule globular, coriaceous, at length wrinkled, about 4 lines diameter. Seeds glabrous.

Hab.: Recorded for Queensland by *F. v. Mueller*.

32. ***I. obscura*** (obscure), *Ker. Bot. Reg.* t. 239; *Benth. Fl. Austr.* iv. 424. A slender glabrous or pubescent twiner. Leaves on slender petioles, broadly and deeply cordate-ovate, acuminate, from under 1 in. to nearly 2 in. long and broad.

Peduncles as long as the petioles, bearing 1 or rarely 2 or 3 yellow flowers. Sepals lanceolate, acute, scarcely 2 lines long in the common form. Corolla campanulate,  $\frac{3}{4}$  to 1 in. long. Capsule globular, smooth. Seeds pubescent.—Chois. in DC. Prod. ix. 370; *Convolvulus obscurus*, Linn. Spec. Pl. 220; *I. latcola*, R. Br. Prod. 485; Chois. in DC. Prod. ix. 369; *I. Brownii*, Roem. and Schult. Syst. iv. 252.

Hab.: Keppel Bay, *R. Brown*; Cape River, *Bowman*.

Common in tropical Asia, extending into tropical Africa and eastward to the Archipelago. The Australian specimens seem to have rather smaller flowers than the Indian ones. The species is readily distinguished from its nearest allies by the small calyx.—*Benth.*

33. **I. incisa** (leaves cut), *R. Br. Prod.* 486; *Benth. Fl. Austr.* iv. 424. Prostrate trailing or scarcely twining, pubescent villous or nearly glabrous, the branches rather slender but sometimes very long. Lower leaves broadly ovate-cordate and deeply and irregularly toothed or lobed, especially below the middle; upper ones oblong or lanceolate, hastate or almost digitate with one long central lobe and several short lateral ones. Peduncles long and slender, bearing 1 or rarely 2 or 3 pink or purplish flowers, the pedicels as long as the calyx, the bracts minute. Sepals lanceolate or ovate-lanceolate, acute or rather obtuse, about 3 lines long. Corolla campanulate,  $\frac{3}{4}$  to nearly 1 in. long. Ovary 2-celled. Fruiting calyx slightly enlarged, the capsule globular and smooth. Seeds glabrous.—Chois. in DC. Prod. ix. 352; *Convolvulus incisus*, Spreng. Syst. i. 699.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

34. **I. uniflora** (1-flowered), *Roem. and Schult. Syst.* iv. 247; *Benth. Fl. Austr.* iv. 425. A glabrous or somewhat silky-pubescent rather slender twiner. Leaves oblong to linear, obtuse or mucronate, entire, narrowed into a short petiole, mostly 1 to 3 in. long. Peduncles shorter than the leaves, bearing usually a single white flower, the pedicel as long as or longer than the calyx, the bracts very minute. Sepals leafy, acute, the outer ones broad and shortly decurrent on the pedicel,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, the inner ones smaller and narrower. Corolla campanulate, longer than the calyx, but rarely exceeding 1 in., more or less hairy outside. Ovary 2-celled. Capsule globular. Seeds glabrous puberulous or bordered by short hairs.—*Aniseia uniflora*, Chois. Conv. Or., and in DC. Prod. ix. 431; Wight, Ic. t. 850; *A. martinicensis* and *A. ensifolia*, Chois. Conv. Or., and in DC. Prod. ix. 430; *A. cernua*, Moric. Pl. Amer. t. 38; Chois. in DC. Prod. ix. 431, and perhaps some other species referred by Choisy to *Aniseia*; Rheede, Hort. Mal. xi. 54.

Hab.: Rockingham Bay, *Dallachy*.

The species are widely dispersed over tropical Asia, Africa, America, and the Pacific islands.

35. **I. angustifolia** (narrow-leaved), *Jacq. Collect.* ii. 367, and *lc. Rar. t.* 317, not of Choisy; *Benth. Fl. Austr.* iv. 425. "Kal-boo-roon-ga," Cooktown. *Roth.* A glabrous annual with slender prostrate trailing or twining stems, usually drying of a black or brown colour. Leaves on very short petioles or almost sessile, linear or lanceolate, acute or acuminate, cordate or hastate, and often toothed at the base, 1 to 2 or even 3 in. long when very luxuriant. Peduncles slender, longer than the leaves, bearing 1 or 2 small yellowish-white flowers. Sepals ovate-lanceolate or lanceolate-acuminate, about 3 lines long. Corolla campanulate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Stamens rather long. Ovary 2-celled. Seeds glabrous.—*I. pilicaulis*, Blume; Chois. in DC. Prod. ix. 353; Bot. Mag. t. 5426; *I. denticulata*, R. Br. Prod. 485; Bot. Reg. t. 317; Rheede, Hort. Mal. xi. t. 55.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*, *Henne*; Cape York, *Hemel*; Rockingham Bay, *Dallachy*; Cape River, *Bowman*; Etheridge River, *W. E. Arnott*; Rockhampton, *P. O'Shanesy*; Stanthorpe and other southern localities.

The species is widely dispersed over tropical Africa and Asia. R. Brown's Australian specimens include a narrow-leaved form corresponding precisely with the Guinea plant originally described by Jacquin and by Vahl, together with the broader-leaved form more prevalent in E. India and the Archipelago.—*Benth.*

36. **I. plebeia** (mean), *R. Br. Prod.* 484; *Benth. Fl. Austr.* iv. 426. A slender twiner, softly pubescent and sprinkled with rather long hairs, which are reflexed on the branches, scattered on the leaves or sometimes wanting. Leaves on slender petioles, cordate-lanceolate or the lower ones broadly ovate-cordate, acuminate, entire or obscurely 3-lobed, with the basal auricles rounded,  $1\frac{1}{2}$  to 3 in long. Peduncles slender, 1-flowered, articulate and minutely bracteate near the base (the peduncle much shorter than the pedicel). Outer sepals ovate-lanceolate, subulate-acuminate, hispid, about 4 lines long; the inner ones smaller. Corolla campanulate, fully  $\frac{1}{2}$  in. long, often pubescent at the top. Stigma with 2 globular lobes. Capsule shorter than the calyx, glabrous, 2-celled. Seeds pubescent.—*Convolvulus plebeius*, Spreng. Syst. i. 604; Choisy in DC. Prod. ix. 412.

Hab.: Bay of Inlets, *Banks and Solander*; Rockingham Bay, *J. Dallachy*; Rockhampton, *P. O'Shanesy*; islands of Moreton Bay, *F. v. Mueller*; Walloon and Comet River, *Bowman*. It does not appear for what reason Choisy removed this plant to the genus *Convolvulus*; the stigma is certainly that of *Ipomœa*, where Brown placed it.—*Benth.*

37. **I. eriocarpa** (capsule woolly), *R. Br. Prod.* 484; *Benth. Fl. Austr.* iv. 426. A twining annual, more or less hirsute with rigid hairs, mostly reflexed on the stem, scattered on the under side of the leaves or confined to the margins and principal veins. Leaves petiolate, from deeply cordate-ovate to lanceolate or hastate, acuminate, 1 to 3 in. long, the upper surface usually glabrous. Peduncles exceedingly short, bearing 1, 2 or rarely more small flowers either quite sessile or very shortly pedicellate. Sepals ovate or ovate-lanceolate, acuminate, hirsute, 2 to 3 lines long. Corolla scarcely exceeding the calyx or sometimes not so long in Australian specimens, rather larger in some extra-Australian ones, slightly hirsute outside. Stigma with 2 globular lobes. Capsule globular, pubescent or hirsute, but becoming nearly glabrous when ripe. Seeds glabrous.—Choisy in DC. Prod. ix. 369; *Convolvulus eriocarpus*, Spreng. Syst. i. 598; *Ipomœa sessiliflora*, Roth.; Choisy in DC. Prod. ix. 366; Wight, Ic. t. 169 (a remarkably luxuriant large-leaved specimen, apparently with an 8-seeded fruit, probably by a mistake of the artist); *I. Horsfieldiana*, Miq. Fl. Ind. Bat. ii. 611; *Convolvulus sphaerocephalus*, Roxb. Fl. Ind. i. 472.

Hab.: Endeavour River, *Banks and Solander*; Burdekin River, *Bowman, Fitzalan*.

The species is common in tropical Africa and Asia, and is also (probably introduced) in the West Indies.

38. **I. heterophylla** (leaves various), *R. Br. Prod.* 487; *Benth. Fl. Austr.* iv. 426. Stems erect or ascending, not twining, rather slender, simple or branched, 1 to 2 ft. high, more or less hirsute, as well as the foliage, with long loose hairs, rarely at length nearly glabrous. Leaves petiolate, lanceolate or oblong, quite entire or bordered by coarse teeth or lobes, especially below the middle, never cordate, 1 to 3 in. long, the upper ones small and narrow. Peduncles very short or the flowers almost sessile, between 2 linear bracts or bracteoles almost as long as the calyx. Sepals lanceolate, subulate-acuminate, ciliate and hispid with long hairs, 3 to 4 lines long. Corolla campanulate, rather longer than the calyx. Stigmas large and broad, usually distinct. Capsule and seeds glabrous.—Choisy in DC. Prod. ix. 354; *I. polymorpha*, Rœm. and Schult. Syst. iv. 254; *Convolvulus Brownii*, Spreng. Syst. i. 612, altered in the Index to *C. Robertsonii*.

Hab.: Islands of the Gulf of Carpentaria. *R. Brown*; Cape York, *Daemel*; Flinders River, *Sutherland*; Rockhampton, *O'Shanesy*; Curriwillingham and Armadilla, *W. Burton*; many other localities.

39. **I. erecta** (stems erect), *R. Br. Prod.* 487; *Benth. Fl. Austr.* iv. 427. Stems from a perennial base, erect or ascending, simple or slightly branched, softly tomentose or villous as well as the foliage and inflorescence, the hairs intricate on the branches, more appressed on the leaves, and often rust-coloured. Leaves very shortly petiolate, oblong or lanceolate, obtuse or acute, not cordate, 1 to 2 in. long, the upper ones smaller and narrower. Peduncles mostly shorter than the leaves, bearing 1, 2 or 3 pink flowers, the pedicels short, the bracts very small. Sepals ovate-lanceolate, rather acute, softly villous or nearly glabrous, of a somewhat firmer consistence at the base as in many species of *Convolvulus*, the outer ones 3 to 4 lines long, the inner ones smaller. Corolla campanulate, about  $\frac{3}{4}$  in. long. Stigmatic lobes very broadly ovate, recurved. Capsule, globular, readily splitting into 6 to 8 valves, as in *Convolvulus parviflorus* and its allies. Seeds glabrous.—*Chois. in DC. Prod.* ix. 354; *Convolvulus erectus*, Spreng. Syst. i. 612.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne.*

40. \***I. coccinea** (crimson), *Linn.; Bot. Mag. t.* 221. A slender twiner. Leaves ovate-cordate, acute, glabrous, 2 to 4 in. long, entire or lobed, on petioles 1 to 3 in. Peduncles about as long as the leaves, bearing a loose cyme of few or many flowers; bracts inconspicuous. Sepals elliptic, suddenly acuminate,  $\frac{1}{4}$  in. long, unaltered in fruit. Corolla crimson (or in some forms orange or yellow); tube about 1 in. long, mouth  $\frac{3}{4}$  in. diameter. Ovary completely 4-celled. Capsule  $\frac{1}{4}$  in. or rather more, ovoid, smooth, completely 4-celled; dissepiments thin, membranous, persistent. Seeds densely furred.—*I. luteola*, Jacq.; *I. phoenicea*, Roxb.; *Convolvulus coccineus*, *phœniceus*, and *lutrolus*, Spreng.; *Quamoclit coccinea*, Mœnch.; *Q. phœnicea*, Chois.

Hab.: South America. Naturalised in many warm countries. Often met with as a weed in cultivation.

41. \***I. Quamoclit** (old generic name), *Linn. Sp. Pl.* 227; *Benth. Fl. Austr.* iv. 428. A slender glabrous twiner. Leaves sessile, deeply pinnatifid, with linear-subulate entire segments. Peduncles longer than the leaves, bearing 1 to 3 scarlet flowers on long pedicels thickened upwards. Sepals obtuse, 2 to 3 lines long. Corolla-tube cylindrical, slender,  $\frac{3}{4}$  to nearly 1 in. long; limb short, spreading, shortly 5-lobed. Stamens and style longer than the tube. Ovary 4-celled, with 1 ovule in each cell. Capsule ovoid-globular, glabrous, rather longer than the calyx, completely 4-celled. Seeds glabrous.—*Bot. Mag. t.* 244; *Quamoclit vulgaris*, Chois. in *DC. Prod.* ix. 336.

Hab.: Common in Queensland.

The species, believed to be of East Indian origin, has long been extensively cultivated for ornament in almost all warm civilised regions, and has established itself as a weed in the New as well as in the Old World.—*Benth.*

42. **I. cataractæ** (after first habitat, Cascade Bay, Norfolk Island), *Endl. Prod. Fl. Norf. Isl.* 53. Stems twining, silky-hirsute. Leaves cordate, entire, or slightly lobed, puberulous above, under surface silky-tomentose, lateral lobes obtuse, middle one acuminate and somewhat obtuse. Peduncles 3-flowered. Involucre polyphyllous; bracts linear, undulate, long as the calyx. Sepals ovate, acuminate, more than half the length of the corolla.—*F. Bauer, Ill. Pl. Norf. Isl. t.* 153 and 151.

Hab.: Recorded for Queensland by *F. v. Mueller.*

5. **LEPISTEMON**, Blume.

(From the scale at base of each stamen.)

Character of *Ipomœa*, but filaments dilated at the base into 5 concave scales which arch over the ovary.

Species few; besides Queensland, met with in Africa and Asia.

Pediceles much longer than the calyx. Leaves cordate-ovate . . . . . 1. *L. urceolatus*.  
 Pediceles shorter than the calyx. Leaves hastate . . . . . 2. *L. Lucæ*.

1. **L. urceolatus** (jug-form), *F. v. M. Syst. Cens. Austr. Pl.* A tall twiner, softly villous, the hairs of the branches reflexed, those of the foliage almost silky. Leaves petiolate, cordate-ovate, acuminate, entire, 3 to 4 in. long. Flowers numerous, in dense almost sessile cymes or clusters, the pedicels much longer than the calyx. Sepals orbicular or broadly ovate, obtuse, hirsute, scarcely above 1 line long. Corolla-tube ovoid, inflated, contracted towards the throat, about  $\frac{1}{2}$  in. long, the limb spreading, scarcely half as long as the tube. Stamens attached at base of corolla, the scales prominent. Anthers yellow. Capsule globular, glabrous, about 3 lines diameter, 2-celled. Seeds 4, glabrous.—*Ipomœa urceolata*, R. Br. Prod. 485; Benth. Fl. Austr. iv. 427; *Convolvulus urceolatus*, Spreng. Syst. i. 601.

Hab: Endeavour River, *Banks and Solander*: common in most of the tropical scrubs.

2. **L. Lucæ** (after Dr. Lucas), *F. v. M. in Vic. Nat., October, 1885*. Branchlets and leafstalks beset with appressed hairs. Leaves hastate, gradually narrowed into an acute apex, the sinus narrow, the lobes ending into a rather acute sometimes excised angle: both sides of the leaves beset with appressed hairs, the under more so than the upper; cymes almost forming umbels. Pedicels during anthesis about as long as the peduncles, shorter than the flowers, appressed-hairy. Sepals ovate-orbicular, minute, many times shorter than the corolla. Stigma didymous: ovary and crenulated disk formed by the scales of filaments glabrous.

Hab: Given between the Endeavour River and Port Douglas, *Dr. Lucas*.

6. **CALYSTEGIA**, R. Br.

(From the calyx being covered by two bracts.)

Sepals ovate or oblong, inner ones smaller. Corolla funnel-shaped or campanulate: limb 5-plaited, subentire. Stamens included. Ovary 1 (imperfectly 2) celled, 4-ovuled; style filiform, stigmatic lobes 2, shortly oblong. Capsule globose, 1-celled, normally 4-seeded. Seeds glabrous. Prostrate or twining herbs, glabrous or nearly so. Leaves entire or lobed. Peduncles 1-flowered. Bracts 2 large, persistent, enclosing the calyx. Flowers usually large, white rose or violet.

The species belong to warm and temperate regions of both hemispheres.

Leaves hastate, acuminate. Bracteoles broadly cordate, almost orbicular.

Calyx 2 lines. Corolla 9 lines long . . . . . 1. *C. marginata*.  
 Leaves cordate or hastate, acute or acuminate. Bracteoles ovate, acute, longer than the calyx. Sepals 4 to 5 lines. Corolla above 2 in. . . . . 2. *C. sepium*.  
 Leaves fleshy, reniform or rounded, cordate, obtuse. Bracteoles ovate, very obtuse, shorter than the calyx. Sepals 4 to 6 lines. Corolla about  $1\frac{1}{2}$  in. long . . . . . 3. *C. Soldanella*.

1. **C. marginata** (margined), *R. Br. Prod.* 483. A glabrous twiner. Leaves on rather long petioles, narrow-lanceolate or broad and triangular, hastate or sagittate, the basal auricles or lobes acute, diverging, and often lobed, the whole leaf usually  $1\frac{1}{2}$  to 2 in. long, but when luxuriant twice as large. Peduncles rarely exceeding the petiole. Bracts very broadly cordate-ovate, from

scarcely longer than the calyx to twice as long. Sepals rarely above 3 lines long. Corolla about  $\frac{3}{4}$  in. long. Ovary very imperfectly 2-celled. Stigmatic lobes ovate, obtuse. Capsule globular, 1-celled. Seeds 4.—*Convolvulus marginatus*, Spreng. Syst. i. 603; Benth. Fl. Austr. iv. 430; *Calystegia marginata*, Choisy in DC. Prod. ix. 434; Hook. f. Fl. N. Zeal. t. 48.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*; common in southern localities.

The species is also in Norfolk Island and in New Zealand. Some specimens have the aspect of some varieties of *Convolvulus erubescens*, but are at once distinguished by the large bracts.—*Benth.*

2. **C. sepium** (found in hedges), *R. Br. Prod.* 483. A tall rather slender herbaceous twiner, quite glabrous or very slightly pubescent, with a creeping perennial rootstock. Leaves from broadly ovate-triangular to lanceolate-hastate, acutely acuminate, cordate with angular basal auricles or lobes, mostly 2 to 4 in. long but sometimes larger. Peduncles longer than the petioles and often as long as the leaves, bearing a single large flower of a pure white or more or less tinged with pink. Bracts large, ovate or ovate-lanceolate, leafy, acute or scarcely obtuse, longer than the calyx and enclosing it. Sepals ovate-lanceolate or lanceolate-acuminate, rather unequal, 4 to 5 lines long. Corolla 2 to 3 in. long. Ovary incompletely 2-celled, surrounded by a cup-shaped disk. Stigmatic lobes ovate or oblong, obtuse. Capsule 1-celled.—*Calystegia sepium*, Choisy in DC. Prod. ix. 433; De Vr. in Pl. Preiss. i. 345; Hook. f. Fl. Tasm. i. 276; *Convolvulus sepium*, Linn.: Benth. Fl. Austr. iv. 430.

Hab.: Southern coast (rare).

The species is abundant in the temperate and subtropical regions of the northern hemisphere, and is also in New Zealand. When on the seacoast the lower leaves are sometimes thicker, shorter, and more obtuse, but appear to me to be always very different from those of *Convolvulus Soldanella*.—*Benth.*

3. **C. Soldanella** (resembling a *Soldanella*), *R. Br. Prod.* 483. A glabrous perennial with a creeping rootstock and prostrate trailing or shortly twining stems. Leaves on rather long petioles, broadly rounded-cordate or kidney-shaped, entire or angular-lobed, rather thick, mostly about 1 in. but sometimes 2 in. diameter. Peduncles 1-flowered, about as long as the leaves. Bracts broadly ovate-cordate, very obtuse, rather shorter than the calyx. Sepals nearly  $\frac{1}{2}$  in. long, broad and thin, all very obtuse or the inner ones almost acute. Corolla pink or purplish, rather smaller than in *C. sepium*. Ovary incompletely 2-celled, surrounded by a cup-shaped disk. Stigmatic lobes ovate or oblong, usually narrower than in *C. sepium*, much shorter and broader than in *C. erubescens*. Capsule 1-celled.—*Calystegia Soldanella*, Choisy in DC. Prod. ix. 433; Hook. f. Fl. Tasm. i. 276; *C. reniformis*, *R. Br. Prod.* 484; *Convolvulus Soldanella*, Linn.: Benth. Fl. Austr. iv. 431.

Hab.: Little Burleigh Head, *J. Shirley*; Fraser's Island, *Hon. Miss Lovell*.

The species is common on the extratropical seacoasts in both the northern and southern hemispheres both of the New and the Old World, including New Zealand, where it varies much more than in the northern hemisphere.

## 7. CONVULVULUS, Linn.

(Most kinds having an interesting habit.)

(*Jacquemontia*, Choisy.)

Corolla campanulate, entire, angular or rarely lobed. Ovary 2-celled, with 2 ovules in each cell. Style filiform, with 2 ovate oblong linear or subulate stigmatic lobes. Fruit a dry capsule, completely or sometimes incompletely 2-celled.—Twining prostrate creeping or erect herbs, or in species not Australian

undershrubs or low shrubs. Leaves entire or rarely toothed, lobed or deeply divided. Flowers axillary, solitary or in corymbose or umbel-like cymes. Seeds glabrous, at least in the Australian species.

A large genus, distributed over the whole area of the Order, less numerous within the tropics than *Ipomœa*, but extending far into the temperate and cooler regions both of the northern and the southern hemispheres.

*Convolvulus* has no character to distinguish it from *Ipomœa* besides the more or less elongated stigmatic lobes of the style, the habit is usually but not always different.—*Benth.*

Flowers solitary or rarely 2 together. Sepals obtuse. Leaves either very narrow or toothed or lobed . . . . . 1. *C. erubescens*.  
 Flowers in cymes. Sepals acuminate. Leaves cordate, entire. . . . . 2. *C. multivalvis*.  
 Softly tomentose. Pedicels short . . . . . 3. *C. parviflorus*.  
 Glabrous or pubescent. Pedicels rather long . . . . .

1. ***C. erubescens*** (flowers reddish), *Sims, Bot. Mag. t. 1067; Benth. Fl. Austr. iv. 429.* A perennial, either glabrous, pubescent or densely tomentose, rarely villous, with a creeping rootstock and slender prostrate trailing or rarely twining stems. Foliage exceedingly variable, the leaves usually more or less sagittate-cordate, the lower ones ovate-lanceolate, the upper ones passing into narrow-lanceolate or linear, with diverging entire or lobed basal auricles and from  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, but sometimes nearly all small, cordate-ovate obtuse and slightly crenate, sometimes nearly all narrow-linear with either very minute or long and linear basal auricles or lobes. Peduncles often as long as the leaves, 1-flowered, with minute bracts at a distance from the calyx. Sepals 2 to nearly 3 lines long, ovate, obtuse or almost acute. Corolla pink or white, usually from  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Ovary and fruit completely 2-celled. Stigmatic lobes linear.—*R. Br. Prod. 482; Chois. in DC. Prod. ix. 412; Hook. f. Fl. Tasm. i. 275; C. remotus, R. Br. Prod. 483; Chois. in DC. Prod. ix. 412 (a small-leaved form); C. angustissimus, R. Br. Prod. 482 (very narrow-leaved specimens); C. adscendens De Vr. in Pl. Preiss. i. 346; C. subpinnatifidus, De Vr. l.c. 347.*

Hab.: Moreton Bay, *A. Cunningham*, and Nerook Creek, *Bowman* (both luxuriant specimens, with large leaves and sometimes 2 flowers on the peduncles); Rockhampton, *O'Shanessy*; Curriwillingham, *Barton* (both the common form). The plant is common in many localities.

2. ***C. multivalvis*** (capsule many-valved), *R. Br. Prod. 483; Benth. Fl. Austr. iv. 429.* A twiner, closely allied to *C. parviflorus*, and considered by most authors as a variety, with the same cordate entire leaves and cymose inflorescence, but densely clothed with a soft close tomentum or velvety pubescence, the peduncles shorter and the capsule longer and much more distinctly splitting into about 8 valves.

Hab.: Keppel Bay, *R. Brown*; Howick's group, *F. v. Mueller*; Nerook Creek and Suttor River, *Bowman*.

Also on the S coast of New Guinea.

3. ***C. parviflorus*** (flowers small), *Vahl: Chois. in DC. Prod. ix. 413; Benth. Fl. Austr. iv. 430.* A tall twiner, glabrous or slightly pubescent. Leaves on rather long petioles, cordate-ovate, acuminate, entire, membranous, 2 to 3 in. long. Peduncles about as long as the leaves, bearing a dense cyme of numerous small flowers. Bracts minute. Sepals ovate, acuminate, pubescent, 2 to  $2\frac{1}{2}$  lines long. Corolla white or pink, very open, above  $\frac{1}{2}$  in. diameter. Stamens rather long. Stigmatic lobes linear-oblong, recurved, much shorter than in *C. erubescens*. Capsule small, completely 2-celled, opening in 4 valves, which are sometimes split but much less so than in *C. multivalvis*.—*C. multivalvis*, var., *R. Br. Prod. 483.*

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Rockingham Bay, *Dallachy*; Rockhampton, *Thozet, Dallachy, and others.*

The species is widely dispersed over E. India and the eastern Archipelago.



## 8. POLYMERIA, R. Br.

(Style-branches many.)

Corolla very broadly campanulate, entire or angular. Ovary 2-celled, with 1 ovule in each cell. Style filiform, with several (4 to 8) or very rarely only 2 linear stigmatic lobes. Fruit a dry capsule with 1 or 2 seeds.—Erect prostrate or trailing herbs, rarely twining. Leaves usually entire. Peduncles axillary, bearing 1 to 3 flowers. Bracts very small.

The genus is limited to Australia. Closely allied to *Convolvulus* in habit as well as in character, it differs in the ovules reduced to 2 (1 only in each cell of the ovary), whilst the stigmatic lobes, in all the Queensland species, are increased in number, probably by their division. Several of the species here enumerated run much one into the other, and they might all well be reduced to two or three.—*Benth.*

Leaves linear or lanceolate.

Leaves glabrous above, fringed with silky hairs. Flowers nearly 1in. long, the sepals very unequal

1. *P. marginata*.

Leaves silky or hoary or glabrous on both sides. Sepals nearly equal.

2. *P. longifolia*.

Stigmatic lobes 6 to 8. Flowers about  $\frac{3}{4}$ in. long; Stems usually erect

Leaves cordate, ovate or oblong.

Outer sepals orbicular-cordate, inner ones narrow

3. *P. calycina*.

Sepals nearly equal.

Stem and leaves usually villous or pubescent. Sepals about 3 lines long

4. *P. ambigua*.

Stem slender. Leaves small or linear, nearly glabrous. Sepals about 2 lines long

5. *P. pusilla*.

1. ***P. marginata*** (marginated), *Benth. Fl. Austr.* iv. 432. Stems erect, under 1ft. high, loosely hirsute. Lower leaves petiolate, oblong, obtuse, deeply cordate, under 2in. long, upper ones nearly sessile, lanceolate or linear-lanceolate, acute, slightly cordate, 2 to 4in. long, all glabrous on both sides, except a few hairs on the veins underneath, but the margins elegantly fringed with rather long hairs. Peduncles shorter than the leaves, 1-flowered, with linear bracts above the middle. Outer sepals broadly lanceolate, acute, 5 or even 6 lines long, the 2 innermost smaller and much narrower. Corolla nearly 1in. long. Stigmatic lobes about 8.

Hab.: Several inland localities.

2. ***P. longifolia*** (long-leaved), *Lindl. in Mitch. Trop. Austr.* 398; *Benth. Fl. Austr.* iv. 432. Stems from a perennial stock erect, slightly branched, usually about 1ft. high or shorter, pubescent or villous as well as the foliage with appressed silky hairs. Leaves almost sessile, linear or linear-lanceolate, mucronate-acute, minutely hastate at the base, often above 2in. long. Peduncles 1-flowered, shorter than the leaves. Sepals oval-oblong, more or less acuminate or acute, about 3 lines long, all nearly equal. Corolla pink, usually about  $\frac{3}{4}$ in. long, but sometimes smaller. Stigmatic lobes usually 6, but sometimes 7 or 8.

Hab.: Near the Gwydir, *Mitchell*; plains of the Condamine. *Leichhardt*; Suttor, *Isaacs*, Bowen Rivers, &c., *Bowman*; Flinders River, *Sutherland*; Armadilla, *Barton*.

3. ***P. calycina*** (calyx large), *R. Br. Prod.* 488; *Benth. Fl. Austr.* iv. 433. A glabrous or slightly pubescent annual (or sometimes with a perennial creeping rootstock?). Stems slender, prostrate or creeping. Leaves on slender petioles, the lower ones ovate, obtuse or emarginate, deeply cordate, under 1in. long, the upper ones oblong linear or lanceolate, obtuse, slightly cordate or rarely hastate at the base, often above 1in. long. Peduncles slender, shorter than the leaves, 1-flowered, with minute bracts at or below the middle. Outer sepals very broadly ovate or cordate, about 3 lines long, the inner ones shorter, ovate-lanceolate or lanceolate, acuminate. Corolla 5 to 6 lines long, broadly

campanulate, slightly silky-pubescent outside. Anthers rather long. Stigmatic lobes about 6. Capsule shorter than the calyx. Seeds pubescent or silky-villous (glabrous according to R. Brown).—Chois. in DC. Prod. ix. 432; Endl. Iconogr. t. 67.

Hab.: Keppel Bay, *R. Brown*, *Thozet*; Rockhampton, *O'Shanesy*; Gracemere, *Bowman*; Moreton Bay, *C. Stuart*.

Some of the narrow-leaved specimens might very well, without close examination, be mistaken for some varieties of *Convolvulus erubescens*. The outer sepals, although variable in breadth, are, however, always broader than in the latter species, independently of the generic character.—*Benth.*

4. **P. ambigua** (ambiguous), *R. Br. Prod.* 488; *Benth. Fl. Austr.* iv. 433. An annual (or sometimes perennial?), with long, slender, creeping or trailing stems, occasionally rooting at the lower nodes and sometimes shortly twining at the extremities. Leaves petiolate, ovate or oblong, obtuse, often mucronate, cordate at the base, usually rugose, glabrous, sparingly pubescent or rarely villous above, more or less villous or silky-hairy underneath, mostly about 1 in. long, but variable in size. Peduncles usually longer than the petioles, bearing 1 to 3 flowers with minute bracts at the base of the pedicels, and usually 2 small bracteoles on the pedicels. Sepals nearly equal, acuminate, about 3 lines long. Corolla not twice as long, very open. Stigmatic branches 4 to 6. Capsule nearly as long as the calyx. Seeds glabrous or very minutely hoary-pubescent.—Chois. in DC. Prod. ix. 432.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Thirsty Sound, *R. Brown*; also in other northern localities.

5. **P. pusilla** (weak), *R. Br. Prod.* 488; *Benth. Fl. Austr.* iv. 434. This may be another small slender form of *P. ambigua*, glabrous or slightly pubescent. Stems almost filiform, prostrate or twining. Leaves on slender petioles, from cordate-ovate obtuse or retuse and under 1 in. long to linear and then entire or hastate at the base. Peduncles 1-flowered, with minute bracts at a distance from the flower. Sepals nearly equal, lanceolate, acuminate, about 2 lines long. Corolla about twice as long, very open. Stigmatic branches usually 4.—Chois. in DC. Prod. ix. 432.

Hab.: Broadsound, *R. Brown*; also from *Bowman's* collection, with short ovate leaves as in *Brown's* specimens; Rockhampton, *O'Shanesy*, and Keppel Bay and Fitzroy River, *Thozet*, with linear leaves.

## 9. EVOLVULUS, Linn.

(Not twining.)

Corolla campanulate or tubular at the base, the limb 5-angled or 5-lobed. Ovary 2-celled, with 2 ovules in each cell. Styles 2, filiform, distinct from the base, each divided into 2 branches; stigmas linear, terminating each branch. Fruit a capsule, with 4 seeds or fewer by abortion.—Herbs, not twining, annual or with a short perennial stock. Leaves entire, usually small. Flowers small, on axillary peduncles or in terminal spikes or racemes.

A considerable tropical American genus, of which one or two species are spread also over the warmer regions of the Old World. The only Australian species is the one most common over the whole area.—*Benth.*

1. **E. alsinoides** (Alsine-like), *Linn.*; *Chois. in DC. Prod.* ix. 447; *Benth. Fl. Austr.* iv. 437. A perennial, with a short almost woody stock, but often flowering the first year so as to appear annual, with numerous slender prostrate or erect stems, 6 in. to 1 ft. long, the whole plant more or less silky-hairy. Leaves usually oblong or lanceolate, sessile or nearly so, 3 to 12 lines long, but varying from ovate to almost linear, obtuse or acute. Flowers small, pale-blue or white, 1 to 3 together on slender axillary peduncles mostly longer

than the leaves, but the lower ones sometimes shorter and the upper ones often long and filiform, forming a loose terminal leafy raceme or narrow panicle. Bracts small under each pedicel. Sepals narrow, acute. Corolla pale-blue and white or entirely of one of these colours, very open or almost rotate, usually about 3 lines diameter, but sometimes larger.—*R. Br. Prod.* 489; *E. unifolius*, Linn.; *R. Br. Prod.* 489; Choisy. in DC. *Prod.* ix. 449; *E. decumbens*, *R. Br. Prod.* 489; *E. villosus*, *R. Br. Prod.* 489, but perhaps not of Ruiz and Pav.; *E. heterophyllus*, Labill. *Sert. Austr. Caled.* t. 29; Choisy. in DC. *Prod.* ix. 449, and probably some others enumerated by Choisy; *E. pilosus*, Roxb. *Fl. Ind.* ii. 106; Wight, *Ill.* t. 168b, fig. 10; Rheede. *Hort. Mal.* xi. t. 64.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*: abundant along the whole coast, *R. Brown* and many others; in the interior, *Mitchell*, *Bowen*, and others: common all over the colony.

Var. *sericeus*. Leaves thicker and very white, with long silky hairs.—*E. argenteus*, *R. Br. Prod.* 489, not of Pursh.—Islands of the Gulf of Carpentaria. *R. Brown*: not uncommon in the north.

## 10. BREWERIA, *R. Br.*

(After Samuel Brewer.)

(*Prevostea*, Choisy.; *Seddera*, Hochst. and Steud.; *Stylisma*, Nutt.)

Corolla campanulate, angular or shortly and broadly 5-lobed, folded in the bud. Ovary 2-celled, with 2 ovules in each cell. Style bifid or divided to the base, with a capitate stigma to each branch. Fruit a dry capsule.—Herbs or undershrubs, with erect prostrate trailing or twining stems, often tomentose or silky.—Leaves usually entire. Flowers axillary, solitary or rarely 2 or 3 together in the Australian species, the upper ones often forming a leafy spike, or in extra-Australian species the peduncles often several-flowered.

The genus, as at present constituted, includes several species from tropical Asia, Africa, and America, but the Australian ones appear to be all endemic.

Silky-pubescent or shortly hirsute. Bracteoles minute.

Leaves linear or lanceolate . . . . .	1. <i>B. linearis</i> .
Lower leaves somewhat cordate, upper ones lanceolate . . . . .	2. <i>B. media</i> .
Densely rusty-tomentose or villous with long hairs. Bracteoles at least as long as the calyx. Outer sepals much larger than the inner. Corolla (blue) under ½ in. long . . . . .	3. <i>B. pannosa</i> .

1. ***B. linearis*** (leaves linear), *R. Br. Prod.* 488; *Benth. Fl. Austr.* iv. 435. Silky-pubescent or hirsute. Stems prostrate or shortly twining. Leaves very shortly petiolate, oblong, linear or narrow-lanceolate, mostly obtuse and about 1 in. long. Peduncles 1-flowered, about half as long as the leaves or sometimes very short, with minute bracts at the base scarcely perceptible. Sepals lanceolate, acuminate, about 3 lines long, the innermost rather smaller. Corolla small. Style in the specimens examined divided to about the middle.—Choisy. in DC. *Prod.* ix. 439.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

2. ***B. media*** (medium), *R. Br. Prod.* 488; *Benth. Fl. Austr.* iv. 436. Pubescent or somewhat silky-hairy. Stems prostrate. Leaves shortly petiolate, the lower ones ovate-oblong or ovate-lanceolate, obtuse or acute and often somewhat cordate at the base, the upper ones lanceolate, acute, rarely above 1 in. long. Peduncles 1-flowered, short, with small bracts at the base. Sepals ovate-lanceolate, subulate-acuminate, slightly unequal, 2 to 3 lines long. Corolla (white?) under ½ in. long. Ovary hirsute at the top with long hairs. Styles cohering to the middle, but readily separable to the base.—Choisy. in DC. *Prod.* ix. 438.

Hab.: Bowen River, *Bowman*, and other northern and inland localities.

3. **B. pannosa** (alluding to the clothing), *R. Br. Prod.* 488; *Benth. Fl. Austr.* iv. 436. Stems from a perennial stock, prostrate or twining, the whole plant densely hirsute with soft ferruginous or silky hairs. Leaves on very short petioles, ovate and acute or the lower ones orbicular and obtuse, thick and soft, under 1 in. long. Flowers blue (*R. Brown*), solitary in the axils or rarely 2 or 3 together, on short pedicels, with a pair of linear bracts about the middle. Sepals very hirsute like the rest of the plant, the outer ones broadly ovate, acuminate, 4 to 5 lines long, the inner ones much smaller, and the innermost one linear-lanceolate. Corolla above  $\frac{1}{2}$  in. long, hairy outside. Ovary hirsute at the top with long hairs. Style divided to about the middle.—*Chois. in DC. Prod.* ix. 438.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

## 11. DICHONDRA, Forst.

(Capsule 2-seeded.)

Corolla campanulate, deeply 5-lobed. Ovary of 2 distinct carpels, each with an almost basal style and 1 or 2 ovules; stigmas capitate. Fruit of 1 or 2 membranous capsules, each with 1 or rarely 2 seeds.—Prostrate creeping small herbs. Leaves entire. Flowers small, axillary.

Besides the Australian species, which is widely spread over the warmer regions of the New as well as the Old World, there is another closely allied to it from Central America.—*Benth.*

1. **D. repens** (creeping), *Chois. in DC. Prod.* ix. 451; *Benth. Fl. Austr.* iv. 438. A slender creeping perennial, rooting at the nodes, usually hoary with a minute pubescence, often silky. Leaves on long petioles, orbicular or reniform, 4 to 8 lines or rarely 1 in. diameter. Flowers solitary, on peduncles shorter than the petioles. Sepals obovate, scarcely 1 line long. Corolla rather shorter than the calyx, (yellow, *Benth.*), white in all the Queensland specimens I have seen. Carpels also shorter than or rarely as long as the calyx, nearly globular.—*R. Br. Prod.* 491; *Hook. f. Fl. Tasm.* i. 278; *Sm. Ic. Ined.* t. 8.

Hab.: Moreton Bay, *F. v. Mueller*; Rockhampton, *O'Shanesy*.

The species is generally diffused over the tropical regions of both the New and the Old World, especially near the sea, extending northward to the southern United States and to China, and southward to the Cape of Good Hope, extratropical S. America and New Zealand.—*Benth.*

## 12. CRESSA, Linn.

(From *Cressus*, appertaining to the Isle of Crete, now Candia.)

Corolla tubular-campanulate; lobes 5, contorted (or otherwise imbricate?) in the bud, not plicate. Ovary 2-celled, with 2 ovules in each cell; styles 2, distinct from the base, each with a capitate stigma. Capsule usually 2-valved and 1-seeded by abortion.—A small branching perennial. Leaves entire. Flowers small, in terminal leafy spikes or heads.

The genus is limited to a single species, common to the warmer regions of the New as well as the Old World.

1. **C. cretica** (of Crete), *Linn.*; *Chois. in DC. Prod.* ix. 440; *Benth. Fl. Austr.* iv. 437. An erect or diffuse, much-branched perennial, sometimes almost woody at the base, rarely exceeding 6 in., hoary silky-pubescent or villous all over. Leaves sessile or the lower ones shortly petiolate, ovate-lanceolate, or in specimens not Australian linear, entire, rarely exceeding  $\frac{1}{4}$  in. Flowers sessile in terminal leafy spikes or heads, rarely reduced to a single flower. Sepals broadly obovate, very obtuse, ciliate, about 2 lines long. Corolla very shortly exceeding

the calyx, hairy outside. Anthers large, oblong. Ovary villous. Capsule ovoid, exceeding the calyx, rarely ripening more than one smooth seed.—*C. australis*, R. Br. Prod. 490.

Hab.: Islands of the Gulf of Carpentaria and Broadsound, *R. Brown*; sandy flats, Port Denison, *W. Hill*: common in the colony.

The species is abundantly spread over sandy maritime or saline districts in the warmer regions of the Old and New World, extending to the Mediterranean region of Europe. The flowers in some of the tropical Australian specimens are larger than usual, but not otherwise different.—*Benth.*

### 13. CUSCUTA, Linn,

(Derived from its Arabic name.)

Sepals distinct or united in a 5-lobed rarely 4-lobed calyx. Corolla campanulate, ovoid or globular, with a short 5-lobed or rarely 4-lobed limb. Anthers usually nearly sessile, with a scale below each in the tube of the corolla. Ovary completely or partially 2-celled, with 2 ovules in each cell. Styles 2, distinct or more or less united; stigmas capitate or acute. Fruit a dry or scarcely succulent capsule, opening transversely or bursting irregularly. Embryo spiral or curved round a fleshy albumen; cotyledons inconspicuous.—Herbs, with leafless thread-like parasitical stems, bearing usually sessile clusters of small sessile or pedicellate flowers, white or pink.

A considerable genus, dispersed over all warm and temperate regions of the globe.

Flowers sessile or very shortly pedicellate in globular clusters.

Calyx-lobes prominently keeled.	Stigmas capitate	1. <i>C. chinensis</i> .
Calyx-lobes not keeled	Stigmas capitate	2. <i>C. australis</i> .
Segments of corolla blunt.	Stigmas acute	3. <i>C. europæa</i> .
Segments of corolla acute.	Stigmas acute	4. <i>C. epithymum</i> .

1. ***C. chinensis*** (of China), *Lam.*; *Engelm. in Trans. Acad. St. Louis*, i. 479; *Benth. Fl. Austr.* iv. 441. Flowers rather small, nearly globular, very shortly pedicellate in globular clusters, sometimes reduced to 2 or 3 flowers and not usually so dense as in *C. australis*. Calyx shorter than the corolla, divided to the middle or rather lower into obtuse lobes, the keels and sutures of the sepals forming 10 rather prominent ribs to the tube. Corolla 1 to 1½ line long, the lobes rather obtuse. Scales of the tube deeply fringed or lobed. Styles distinct, unequal, rather slender, with capitate stigmas. Capsule bursting irregularly.—*C. carinata*, R. Br. Prod. 491.

Hab.: Bay of Inlets and Cape Grafton, *Banks and Solander* (Herb. Mus. Brit.); on *Indigofera*, Etheridge River, *W. E. Armit*.

Apparently common in tropical Asia, extending from Madagascar and Ceylon to China.

2. ***C. australis*** (Australian), *R. Br. Prod.* 491; *Benth. Fl. Austr.* iv. 441. Flowers nearly globular, sessile or very shortly pedicellate, in globular clusters, sometimes reduced to 2 or 3 flowers, each about 1½ line diameter, and all the parts minutely glandular-dotted. Calyx shorter than the corolla, divided to below the middle into obtuse lobes, without prominent ribs. Corolla-lobes very obtuse, at length recurved. Scales of the tube bifid or fringed, sometimes very small but often nearly as long as the tube. Ovary much depressed; styles distinct, rather thick, unequal, with capitate stigmas. Capsule depressed, with a broad rhomboidal area between the styles.—*C. obtusiflora*, H.B. and K.; *Engelm. in Trans. Acad. St. Louis*, 491.

Hab.: Broadsound, *R. Brown*; Rockhampton, *P. O'Shanesy*; common on *Polygonum* in southern localities.

The species is widely dispersed over the warmer parts of America and Asia, extending northwards to the southern United States and to S. Europe.

3. **C. europæa** (of Europe), *Linn.* European or Great Dodder. Flowers aggregate, nearly sessile. Calyx shortly obconic, with bluntish segments. Corolla urceolate, campanulate, white, usually 4-cleft, and tetrandrous sometimes 5-cleft and pentandrous, no epipetalous scales, throat naked. Stigmas acute, filiform. Capsule about 1 line diameter. Seeds usually 4, ellipsoid, brown.

Hab.: An European pest, too common on Lucerne.

4. **C. epithymum** (upon Thyme). The Lesser Dodder. Flowers fascicled, more crowded than in *C. europæa*, nearly sessile, 5 or frequently 4-cleft and tetrandrous. Epipetalous scales crescent-shaped, crenulate. Calyx reddish. Corolla white, campanulate, with acute segments. Stigmas acute.

Hab.: An European pest. On *Apium leptophyllum*, Toowoomba.

## ORDER LXXXVI. SOLANACEÆ.

Flowers regular or nearly so. Calyx free, usually with 5, rarely with 4, 6 or 10 teeth lobes or segments. Corolla with 5 or rarely with 4 teeth or lobes, induplicate-plicate or rarely imbricate in the bud. Stamens as many as lobes of the corolla and alternate with them; anthers various, usually 2-celled. Ovary superior, 2-celled or rarely spuriously 4-celled or abnormally 3 or more-celled; style simple, terminal, with an entire or lobed stigma. Fruit an indehiscent berry or rarely a capsule, with several seeds. Embryo usually curved or spiral, surrounding a fleshy albumen, rarely straight in the centre of the albumen.—Herbs shrubs or soft-wooded trees. Leaves alternate, without stipules. Flowers solitary or in centrifugal cymes or unilateral racemes, usually at first terminal but becoming lateral by the elongation of the shoot, rarely axillary, the cymes or racemes usually without bracts, and no bracteoles on the pedicels.

A numerous Order in the tropical and warmer regions of the globe, and more especially S. America, with a comparatively few species straying into more temperate districts both in the northern and the southern hemisphere.

TRIBE I. **Solanææ**.—*Corolla-limb plaited or the lobes valvate. Fruit a berry. Seeds much compressed, subdiscoid. Embryo peripheric.*

- |                                                                                                                      |                  |
|----------------------------------------------------------------------------------------------------------------------|------------------|
| Leaves pinnate; pinne toothed or lyrate. Anthers opening in slits . . .                                              | 1.*LYCOPERSICUM. |
| Leaves entire, lobed or pinnatifid. Anthers opening in terminal pores or slits . . .                                 | 2. SOLANUM.      |
| Calyx inflated over the fruit, shortly lobed. Anthers opening in longitudinal slits. Pedicels solitary . . .         | 3. PHYSALIS.     |
| Calyx small. Corolla deeply 5-fid; lobes valvate. Pedicels solitary or in pairs . . .                                | 4.*CAPSICUM.     |
| Calyx inflated over the fruit. Corolla wide-campanulate, shortly lobed, cordate at the base. Pedicels solitary . . . | 5.*NICANDRA.     |

TRIBE II. **Atropææ**.—*Corolla-lobes more or less imbricate. Fruit a berry. Seeds compressed. Embryo peripheric.*

- |                                                                                               |            |
|-----------------------------------------------------------------------------------------------|------------|
| Calyx small. Corolla contracted into a tube at the base, the lobes imbricate in the bud . . . | 6. LYCIUM. |
|-----------------------------------------------------------------------------------------------|------------|

TRIBE III. **Hyoscyameæ**.—*Corolla-lobes plaited or imbricate. Fruit capsular. Seeds somewhat compressed. Embryo peripheric.*

- |                                                                                                  |            |
|--------------------------------------------------------------------------------------------------|------------|
| Flowers solitary. Calyx tubular, circumscess. Capsule 4-celled, 4-valved or subindehiscent . . . | 7. DATURA. |
|--------------------------------------------------------------------------------------------------|------------|

TRIBE IV. **Cestrineæ**.—*Corolla-lobes induplicate-valvate. Fruit capsular. Seeds scarcely compressed. Embryo straight.*

- |                                                                                                           |               |
|-----------------------------------------------------------------------------------------------------------|---------------|
| Calyx 5-fid. Corolla funnel-shaped, 5-lobed. Stamens attached in the lower part of the corolla-tube . . . | 8. NICOTIANA. |
|-----------------------------------------------------------------------------------------------------------|---------------|

TRIBE V. **Salpiglossideæ**.—Corolla 5-lobed, the lobes more or less induplicate or folded in the bud and sometimes also slightly imbricate, the 2 upper ones (those next to the main axis of inflorescence) outside. Embryo often slightly curved. Inflorescence centrifugal.

Corolla funnel shaped or rarely salver-shaped. Stamens attached in the middle or lower down the tube. Stigma dilated. Capsule 2 celled, 2-valved.

Seeds numerous; testa foveolate-rugose. . . . . 9.\*PETUNIA.

Fruit a berry. Anthers 1-celled . . . . . 10. DUBOISIA.

## 1. **LYCOPERSICUM**, Mill.

(From the Greek; wolf-peach.)

Sepals 5 to 6, narrow, unaltered in fruit. Corolla rotate, tube very short; limb 5 to 6-fid, plaited in bud. Stamens 5 to 6, on the corolla-tube. Anthers connivent in an elongated cone, dehiscing by slits. Ovary 2 to 3-celled. Style cylindrical; stigma small, capitate. Seeds many, compressed, papillose; embryo peripheric.—Tail pubescent herbs. Leaves pinnate, pinnæ toothed or lyrate. Cymes pedunculate, few-flowered.

American plants.

1. **L. esculentum** (a food plant), Mill.; DC. *Prod.* xiii. 26. The Tomato or Love Apple. Flowers yellow, about  $\frac{1}{2}$  in. in diameter. Berry about 1 in. diameter or more, the one most generally met with on scrub land, globose and red.—*L. cerasiforme*, Dunal, Sol. 113; Clarke in Hook. Fl. Brit. Ind. iv. 237; *Solanum Lycopersicum*, Linn.

Hab.: South America.

The fungus-blight (*Macrosporium Tomato*, Cooke) which at times infests the Tomato in cultivation I have never noticed on the naturalised plants.

## 2. **SOLANUM**, Linn.

(Name of doubtful meaning.)

Calyx with 5, rarely with 4 or more than 5 teeth or lobes. Corolla rotate or very broadly campanulate, with 5 or rarely 4 angles or lobes, folded in the bud. Filaments usually very short, rarely as long as the anthers; anthers oblong or linear, erect and connivent, either parallel or more frequently tapering upwards and forming a cone round the style, opening at the top in pores or transverse slits, rarely continued down the sides of the anthers, without any prominent connectivum between the cells. Fruit a berry, usually 2-celled rarely 4-celled (the cells divided by a spurious dissepiment) or in species or varieties not Australian several-celled. Seeds several, flattened, with a curved or spiral embryo surrounding a fleshy albumen.—Herbs shrubs or rarely low soft-wooded trees, either unarmed or with prickles scattered on the branches, on the principal veins of the leaves, especially on the upper surface and in some species also on the inflorescence and calyxes, straight and slender in most Australian species, stout and recurved in some others. Leaves alternate, but often in pairs, a smaller one being developed in the axil of the larger one, entire or irregularly toothed lobed or divided. Flowers normally in terminal centrifugal cymes; but, owing to the rapid development of the branch, the inflorescence becomes usually lateral and very often, by the abortion of one branch, reduced to a simple unilateral apparently centripetal raceme or to a single flower. Corolla usually blue purplish or white or in species not Australian yellow, always tomentose outside in the species where the tomentum is stellate, but usually only on the part exposed in the bud, with the induplicate margins glabrous. Style frequently curved to one side, the stigma slightly dilated, entire or 2-lobed.

A very large genus, spread over the warmer and temperate regions of the globe, but most abundant in tropical America.

The distinction and determination of the numerous species of this genus (most extravagantly multiplied by Dunal in the 'Prodromus') is attended with peculiar difficulties, the chief characters being derived from the very variable ones of foliage, armature and indumentum. The sections

proposed by Sendtner, Dunal, and others break down in several instances, and are scarcely applicable to the Australian species. The three first here enumerated have a marked difference in the anthers, but there are extra-Australian intermediates; the differences in the form of the corolla, often very difficult to ascertain from dried specimens, are seldom in relation to other characters; and the form and colour of the fruit varies in a remarkable degree in some individual species. If, therefore, in the following key I have founded the principal groups or series chiefly upon indumentum and armature, it is not that I regard them as good sections, but only because I have as yet found no better way of leading to the determination of the Australian species.—*Benth.*

§ 1. *No prickles. Whole plant glabrous or pubescent with simple hairs (not stellate).*

Anthers very obtuse, parallel the terminal slits continued more or less down the sides.

Annual. Leaves ovate on long petioles. Flowers very small, in pedunculate umbels

1. *S. nigrum*.

Perennials or shrubs. Leaves lanceolate or linear, entire or pinnatifid. Flowers in short lateral loose racemes.

Leaves mostly acute, the longer ones with a few long lobes.

Flowers large. Berries green or yellow

2. *S. aviculare*.

Leaves mostly obtuse, very rarely and shortly lobed. Flowers moderate. Berries purple

3. *S. simile*.

Anthers tapering upwards, opening only at the end. Glabrous shrub.

Leaves broadly lanceolate. Corolla deeply lobed

4. *S. pseudocapsicum*.

Shrub. Leaves ovate, pubescent underneath

5. *S. Shauesii*.

§ 2. *No prickles. Stellate pubescence or tomentum on the whole plant or rarely on the flowers only.*

Flowers in forked pedunculate cymes.

Leaves quite glabrous. Cymes loose. Corolla deeply lobed

6. *S. viride*.

Leaves (large) very soft and densely tomentose. Cymes dense.

Leaves shortly acuminate, without stipule-like leaves at the base

8. *S. verbascifolium*.

Leaves long-acuminate, mostly with small semicircular stipule-like leaves at the base

9. *S. auriculatum*.

Flowers in simple lateral racemes or clusters.

Leaves sprinkled with scattered stellate hairs. Corolla deeply lobed

7. *S. tetrandrum*.

Leaves densely or closely tomentose underneath or on both sides.

(See § 3, of which several species, especially *S. discolor*, *S. esuriate*, *S. furfuraceum*, and *S. dianthophorum*, are occasionally unarmed.)

§ 3. *Prickles slender on the branches and leaves (numerous few or very rare), none on the calyces. Stellate pubescence or tomentum on the whole plant or rarely on the flowers only.*

Leaves ovate-acuminate, repandly-lobed; petioles about 2in. Fruit yellow, globular, 1in. diameter

10. *S. macrocarai*.

Leaves glabrous above except along the veins (rarely scabrous-pubescent in *S. violaceum*), tomentose underneath (except in *S. defensum*).

Flowers rather small, the corolla deeply lobed.

Leaves tomentose and white underneath.

Leaves ovate or elliptical, rarely above 2in. long. Tomentum very close and short

11. *S. discolor*.

Leaves lanceolate, large and broad or small and narrow, mostly acute. Tomentum close or loose

12. *S. stelligerum*.

Leaves narrow-oblong, obtuse, usually small. Tomentum close

13. *S. parvifolium*.

Leaves green underneath, glabrous or loosely stellate-hairy.

Leaves linear or linear-lanceolate, entire or hastate.

Branches slender. Prickles abundant

14. *S. ferocissimum*.

Branches almost glabrous. Prickles slender, numerous.

Corolla white

15. *S. sporadotrichum*.

Leaves oblong-lanceolate, pinnatifid, 5 to 6in. long

16. *S. defensum*.

Flowers large, the corolla-lobes broad and short.

Leaves broadly lanceolate. Ovary 2-celled

17. *S. violaceum*.

Leaves oblong-linear or linear-lanceolate. Ovary 2-celled

18. *S. amblymerum*.

Leaves oblong or ovate-oblong, obtuse, cordate at the base. Ovary 4-celled

19. *S. tetrabecum*.

Leaves closely whitish tomentose on both sides (the tomentum rarely disappearing at length on the upper side). Calyx-teeth very small at the time of flowering.

Leaves small, mostly broad on very short petioles.

Leaves under ½in. long, ovate or broadly oblong

20. *S. elacophyllum*.

Leaves cordate or orbicular, about ½in. long. Corolla deeply lobed

21. *S. orbiculatum*.



- Leaves narrow or on long petioles, mostly above  $\frac{3}{4}$  in. long.  
 Leaves ovate oblong or lanceolate, entire or sinuate-toothed.  
 Corolla deeply lobed ( $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter) . . . . . 22. *S. esuriale*.  
 Leaves ovate-lanceolate or lanceolate, mostly lobed at the base.  
 Corolla-lobes rather short ( $\frac{1}{2}$  in. diameter) . . . . . 23. *S. chenopodium*.  
 Leaves oblong or lanceolate, entire. Corolla with short broad lobes  
 ( $\frac{3}{4}$  to 1 in. diameter) . . . . . 24. *S. Sturtianum*.  
 Leaves densely and softly tomentose or velvety-hirsute on both sides or  
 at least underneath, sometimes greener and shortly tomentose  
 above.  
 Racemes short, few-flowered or pedicels solitary or 2 together. Calyx  
 divided nearly to the base into narrow segments.  
 Calyx-segments subulate-acuminate.  
 Leaves mostly entire, scabrous above with scattered hairs.  
 Stems usually prickly. Flowers mostly racemose . . . . . 25. *S. furfuraceum*.  
 Prickles exceedingly rare. Flowers mostly in pairs . . . . . 26. *S. dianthophorum*.  
 Leaves densely velvety-tomentose on both sides, the larger  
 ones much sinuate . . . . . 27. *S. Dallachii*.  
 Calyx-segments lanceolate, acute. Leaves densely velvety-  
 tomentose or hirsute on both sides . . . . . 28. *S. densevestitum*.  
 Calyx-segments oblong-linear, obtuse. Leaves (small) densely  
 tomentose . . . . . 29. *S. nemophilum*.  
 Racemes or cymes many-flowered, on long very prickly peduncles.  
 Leaves green and closely tomentose above, white and softly tomen-  
 tose underneath, often lobed . . . . . 30. *S. semiarmatum*.  
 § 4. Prickles slender or rarely thickened at the base on the calyxes as well as on the branches  
 and generally on the leaves. Stellate pubescence, rarely mixed with simple hairs, or all simple,  
 on the whole plant or on the corolla only.  
 Leaves green and glabrous or sprinkled with stellate hairs or hirsute on  
 the upper or both sides, sinuate-lobed or pinnatifid.  
 Leaves deeply pinnatifid; lobes mostly obtuse.  
 Prickles and midrib reddish. Flowers violet, with pale centre.  
 Berry globose . . . . . 31. \**S. pyracanthum*.  
 Prickles stout, hairs stellate. Flowers violet. Berry variegated  
 white and yellow . . . . . 32. \**S. sodomeum*.  
 Prickles stout, hairs simple. Flowers whitish. Berry rich scarlet . . . . . 33. \**S. aculeatissimum*.  
 Prickles stout, curved. Leaves white on the under side. Berry  
 large, bearing short conical prickles . . . . . 34. \**S. aculeastrum*.  
 Leaf-lobes mostly acute. Corolla unarmed . . . . . 35. *S. xanthocarpum*.  
 Leaves sprinkled with stellate hairs or hirsute, without any glandular  
 pubescence.  
 Flowers hermaphrodite, in pairs, the pedicels slender, not racemose.  
 Calyx-lobes narrow, acuminate . . . . . 36. *S. pungetum*.  
 Flowers hermaphrodite, racemose. Calyx-lobes broad, acute . . . . . 37. *S. eremophilum*.  
 Leaves hirsute and glandular-pubescent on both sides. Flowers  
 racemose.  
 Corolla large, broadly campanulate, very shortly lobed . . . . . 38. *S. campanulatum*.  
 Corolla rather small, deeply lobed . . . . . 39. *S. adenophorum*.  
 Leaves green and glabrous or slightly stellate above, white and  
 densely tomentose underneath. Leaf-lobes rather acute. Calyx-  
 lobes acuminate . . . . . 40. *S. cinereum*.  
 Leaves pinnatifid, narrow, shortly tomentose, with very numerous long  
 prickles. Calyx-lobes broad, obtuse or acute, much enlarged round  
 the fruit after flowering . . . . . 41. *S. carduiforme*.  
 Leaves obtuse (mostly under 2 in. long), entire or sinuate, with few or  
 no prickles.  
 Fruiting-calyx membranous, globular, very prickly, completely en-  
 closing the fruit. Leaves ovate or oblong . . . . . 42. *S. echinatum*.  
 Fruiting-calyx open, 6 to 8 lines diameter. Ovary 3-celled . . . . . 43. *S. ellipticum*.  
 Leaves mostly acuminate or acute (3 in. long or more), entire, not at all  
 or scarcely prickly. Flowering-calyx under 3 lines long; fruiting-  
 calyx 6 to 8 lines diameter. Ovary 4-celled . . . . . 44. *S. quadriloculatum*.  
 1. **S. nigrum** (black), *Linn. Sp. Pl.* 266; *Benth. Fl. Austr.* iv. 446.  
 An erect annual or biennial, with very spreading branches, 1 to nearly 2 ft. high,  
 glabrous or pubescent with simple hairs, without prickles, but the angles of the  
 stem often raised and smooth or rough with prominent tubercles. Leaves  
 petiolate, ovate, with coarse irregular angular teeth or nearly entire, 1 to 2 in.

long. Flowers small and white, in little cymes usually contracted into umbels, on a common peduncle, from very short to nearly 1 in. long. Calyx 5-toothed or lobed to the middle. Corolla deeply lobed, 3 to nearly 4 lines diameter. Anthers very obtuse and short, opening in terminal slits, often at length continued down the sides. Berry small, globular, usually nearly black, but sometimes green yellow or dingy red.—R. Br. Prod. 445; Hook. f. Fl. Tasm. i. 288, and Fl. Brit. Ind. iv. 229: *Solanum* "*Morella vera*," Dun. in DC. Prod. xiii. part i. 45 to 59, as to the greater number of the supposed species included in the group; *S. rubrum*, Mill.; Nees, in Pl. Preiss. i. 345; Rheede, Hort. Mal. x. t. 73; Rumph. Herb. Amb. vi. t. 26, fig. 2.

Hab.: Broadsound, *R. Brown*; Port Curtis, *McGillivray*; met with in all parts.

The form with reddish fruit found in Europe has not been met with in Queensland. Two of the forms, however, are common in most parts—one with black fruit, and of erect habit; the other of somewhat straggling habit, more or less downy, and the fruit somewhat greenish. It is this last-mentioned form, I believe, that possesses the dangerous properties; children often eat the ripe berries without any ill-consequences, at other times they are made very ill from eating them. Deaths of cows have been recorded from eating the green plant.

2. ***S. aviculare*** (eaten by birds), *Forst. Prod.* 18; *Benth. Fl. Austr.* iv. 447. An erect glabrous unarmed vigorous undershrub or shrub, attaining 5 or 6 ft. or even more, flowering the first year so as then to appear herbaceous. Leaves lanceolate, acute or rarely almost obtuse, mostly entire on the older shrubby individuals, often pinnatifid with 1, 2 or 3 lanceolate lobes on each side on the younger ones, especially the first year, the larger leaves 6 to 10 in. long, but in some specimens all under 4 in., tapering at the base and often shortly petiolate, in some varieties decurrent so as to form raised angles on the stems. Flowers few, large, in short loose pedunculate racemes, mostly lateral. Pedicels rather long. Calyx-lobes short, broad, very obtuse or mucronate. Corolla  $\frac{3}{4}$  to 1 in. diameter, very shortly and broadly lobed. Filaments filiform, as long as or longer than the anthers, which are oblong, very obtuse, parallel, opening in terminal transverse slits, which are at length more or less continued down the sides and often to the base. Stigma capitate, slightly 2-lobed. Berries ovoid or globular, green or yellow, rather large.—Dun. in DC. Prod. xiii., part i. 69; Hook. f. Fl. Tasm. i. 288; *S. laciniatum*, Ait. Hort. Kew, ed. 1, i. 247; R. Br. Prod. 445; Bot. Mag. t. 349; Dun. l.c. 69; *S. reclinatorum*, L'Hér.; Dun. l.c. 68; *S. rescum*, F. v. M. in Trans. Vict. Inst. 1857, 69, in Hook. Kew Journ. viii. 165 and 166, and Pl. Vict. ii. t. 62.

Hab.: Abundant in southern scrubs.

According to Dr. Joseph Banerott, this plant is poisonous.

Dr. T. L. Banerott states that the plant contains a large amount of volatile alkaloid poison, which probably is nicotinic.

3. ***S. simile*** (like some plants of *S. aviculare*), *F. v. M. Trans. Phil. Soc. Vict.* i. 19, and *Fragm.* vi. 145; *Benth. Fl. Austr.* iv. 448. A glabrous erect unarmed undershrub or shrub, closely resembling entire-leaved specimens of *S. aviculare*, usually not so stout, although attaining 4 or 5 ft. Leaves lanceolate or linear, usually obtuse, contracted into a short petiole, not decurrent, entire or rarely with 1 or 2 short lobes on each side near the base, mostly only 2 or 3 in. long. Flowers smaller than in *S. aviculare*, few in lateral racemes, with a very short or sometimes scarcely any common peduncle. Calyx and corolla otherwise nearly as in *S. aviculare*, the corolla not much above  $\frac{1}{2}$  in. diameter. Anthers obtuse, parallel, opening at length down the sides. Berry globular, ovoid or oblong, usually smaller than in *S. aviculare*, and purple. Seeds rather large.—*S. laciniatum*, var., R. Br. Prod. 445; *Benth.* in Hüg. Enum. 82; Nees, in Pl. Preiss. i. 345; *S. fasciculatum*, F. v. M. *Fragm.* i. 123, vi. 144.

Hab.: Southern scrubs.

4. ***S. pseudo-capsicum*** (fruit resembling a Capsicum), *Linnc.; Dun. in DC. Prod.* xiii. part i. 152; *Benth. Fl. Austr.* iv. 448. A glabrous unarmed erect shrub or undershrub, attaining 3 to 4 ft. Leaves broadly lanceolate, entire,

contracted into a rather long petiole. Pedicels lateral, solitary or 2 or 3 together in a cluster or on a very short common peduncle. Calyx deeply divided into ovate lanceolate herbaceous segments. Corolla white, rather small, divided to about the middle. Filaments short; anthers connivent and tapering upwards. Berry globular, bright-red or yellow.

Hab.: A stray from cultivation.

5. **S. Shanesii** (after P. O'Shanesy), *F. v. M. Fragm.* vi. 144 and 254; *Benth. Fl. Austr.* iv. 448. An erect shrub, attaining 8ft., with slender glabrous branches. Leaves deciduous, solitary or the upper ones in pairs, ovate, acuminate, membranous, entire, glabrous above, sprinkled underneath with simple not stellate hairs,  $1\frac{1}{2}$  to 2in. long, the lamina decurrent on a rather long petiole. Calyx cup-shaped,  $1\frac{1}{2}$  line long, truncate or repand. Corolla blue, deeply 5-lobed; lobes lanceolate, about 3 lines long. Stamens free. Filaments very short. Anthers linear-oblong, somewhat attenuated, yellow, 2 lines long, pores terminal. Style straight, glabrous, almost 3 lines long. Stigma capitate, minute. Fruiting pedicels solitary or 2 together, reflexed. Berry globular, red, about  $\frac{1}{2}$ in. diameter.

Hab.: More's Creek, Rockhampton, *Dallachy*, *O'Shanesy*.

6. **S. viride** (green), *R. Br. Prod.* 445; *Benth. Fl. Austr.* iv. 449. "Boollally," Barron River, *J. F. Bailey*. An erect undershrub or shrub of 6 to 12ft. or even more, quite glabrous except the stellate pubescence of the flowers, and sometimes a very few small stellate hairs scattered on the upper leaves. Leaves solitary or in pairs, ovate-oblong, obtuse, shortly acuminate or rather acute, membranous, entire or obscurely sinuate, 3 to 5in. long on rather long petioles. Flowers in forked pedunculate cymes, terminal or lateral, the branches of the cyme short, the pedicels often above  $\frac{1}{2}$ in. long after flowering, the whole inflorescence and calyx glabrous or slightly stellate-tomentose, the corolla always stellate-pubescent outside. Calyx scarcely above 1 line long at the time of flowering, the lobes obtuse either very short or separating to the middle. Corolla deeply divided into narrow lobes of 3 to 4 lines. Filaments very short; anthers connivent and tapering upwards. Berries small, globular, red.—*Dun.* in *DC. Prod.* xiii. part i. 190; *S. viridifolium*, *Dun. l.c.* 73.

Hab.: Broadsound, *R. Brown*; Cape Grafton, *Banks* and *Solander*; Cape York, *Dumet*; islands off the N.E. coast. *A. Cunningham*, *M'Gillivray*, *F. v. Mueller*, and others; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Port Mackay, *Nerust*; common in the tropical scrubs.

7. **S. tetrandrum** (4 stamens), *R. Br. Prod.* 445; *Benth. Fl. Austr.* iv. 449. An erect unarmed undershrub of 2 to 3ft., sprinkled with a small stellate tomentum, rather dense on the inflorescence, more scattered on the leaves and sometimes disappearing from the upper surface. Leaves mostly in pairs, petiolate, ovate, obtuse or shortly acuminate, entire or obscurely sinuate, membranous, the larger ones 3 to 6in. long. Flowers small, in short loose lateral racemes, the common peduncle not so long as in *S. viride* and not at all or very rarely forked. Calyx 2 to  $2\frac{1}{2}$  lines long, very tomentose, unequally divided to about the middle. Corolla stellate-pubescent outside, under  $\frac{1}{2}$ in. long, divided nearly to the base into narrow lobes. Filaments short; anthers connivent and tapering upwards. Berry small globular.—*Dun.* in *DC. Prod.* xiii. part i. 194; *Seem. Fl. Vit.* 176; *S. inamœnum*, *Benth.* in *Hook. Lond. Journ.* ii. 228; *Dun. l.c.* 269.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

The species is also in the South Pacific islands. The flowers, in this as in *S. viride*, are occasionally, but not always, 4-merous; several 5-merous flowers occur indeed in *Brown's* own specimens.—*Benth.*

Var ? *floribundum*. Corollas larger, very tomentose, and one of the peduncles of the specimen forked.—From *Leichhardt's* collection, a single specimen in *Herb. F. v. Mueller*.—*Benth.*

8. ***S. verbascifolium*** (Verbascum-like), *Ait.*; *Dun. in DC. Prod.* xiii. part i. 114; *Benth. Fl. Austr.* iv. 449. A tall stout unarmed shrub, attaining often 10 to 20ft., thickly covered with a stellate tomentum often very dense and floccose or velvety, sometimes more scattered on the upper side of the leaves. Leaves ovate, acuminate, entire, soft and thick, often 6 to 8in. long, on long petioles. Flowers often numerous, in dense pedunculate dichotomous cymes, terminal or at length lateral, the pedicels very short. Calyx densely tomentose, the lobes shorter than the tube, thick and obtuse. Corolla white, under  $\frac{1}{2}$ in. diameter. Filaments short; anthers scarcely tapering but opening only at the end. Berry globular, yellow, under  $\frac{1}{2}$ in. diameter.—*R. Br. Prod.* 444; *Clarke, in Hook. Fl. Brit. Ind.* v. 230; *Wight. Ic. t.* 1398.

*Hab.*: Broadsound and Shoalwater Bay, *R. Brown*; Brisbane River, Moreton Bay, *Fraser, F. v. Mueller*; Rockhampton, Rockingham Bay, *Dallachy*; Nerook Creek, *Bourman*; Port Denison, *Fitzalan, Dallachy*.

The species is widely dispersed over tropical Asia and America.

Bark bitter, slightly poisonous, *Dr. T. L. Bancroft*.

Wood of a yellow colour, easily worked, of a close grain, and light.—*Bailey's Cat. Ql. Woods* No. 289.

9. \****S. auriculatum*** (auriculate), *Ait.*; *Dun. in DC. Prod.* xiii. part i. 115; *Benth. Fl. Austr.* iv. 450. A tree closely resembling *S. verbascifolium*, but more densely woolly, the leaves more acuminate, with a pair of stipule-like small semicircular leaves at the base of most of the petioles, and purple flowers. Berries yellowish,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. diameter.

*Hab.*: A tropical American species, naturalised in many parts of the colony.

10. ***S. macoorai*** (aboriginal name for south peak of Bellenden Ker Range), *Bail. Bot. Bull.* viii. A shrub of straggling habit, attaining from 5 to 7ft. in height, the young shoots purplish, appearing glabrous, but with the aid of a lens seen to be more or less covered with minute stellate hairs. Prickles straw-coloured, straight, on the branches, petioles, midrib and principal veins on both sides of leaf. Leaves ovate, acuminate, unequal-sided at the base and tapering to a petiole of about 2in.; the margins repandly lobed. No flowers seen. Fruit solitary, on a peduncle of about 1in., globular, yellow, about  $\frac{3}{4}$ in. diameter. Calyx-tube (as seen at base of fruit) with 5 blunt prominent ribs; lobes 2 or 3 lines long, with recurved points.

*Hab.*: Summit of south peak. Bellenden Ker.

11. ***S. discolor*** (2-colored), *R. Br. Prod.* 445; *Benth. Fl. Austr.* iv. 450. An erect shrub, with weak half-climbing branches, the young ones as well as the under side of the leaves and inflorescence silvery or hoary with a minute exceedingly close but dense stellate tomentum. Prickles few, slender on the branches and veins of the leaves or in some specimens none. Leaves petiolate, irregularly oval elliptical or broadly oblong, rather obtuse, entire or irregularly sinuate, glabrous and smooth on the upper surface, 1 to 2in. long in flowering specimens, larger in barren shoots. Flowers rather small, in simple lateral racemes, few or even solitary with a very short common peduncle on the fruit-bearing specimens, numerous along a slender rhachis but very deciduous upon apparently sterile ones, the pedicels short at the time of flowering, 3 to 4 lines long and thickened under the fruit. Calyx very small and shortly toothed when in flower, somewhat enlarged and more deeply cleft under the fruit. Corolla white, deeply lobed, about or under  $\frac{1}{2}$ in. diameter. Berries globular, of a greenish-white, about 4 lines diameter.—*Dun. in DC. Prod.* xiii. part i. 293; *S. corifolium*, *F. v. M. Fragn.* ii. 166.

*Hab.*: All parts.

This and the three following species (*S. stelligerum*, *parrifolium*, and *ferocissimum*) are closely allied to each other, having nearly the same flowers and fruit, and differing chiefly in foliage and prickles.—*Benth.*

12. **S. stelligerum** (starry hairs), *Sm. Exot. Bot.* ii. 57, t. 88; *Benth. Fl. Austr.* iv. 450. An erect shrub, sometimes small and slender, sometimes attaining 6ft. or even more, the branches, under side of the leaves, and inflorescence covered with a stellate tomentum, often loose and floccose. Prickles straight or slightly recurved on the branches and sometimes on the upper side of the leaves, but not numerous. Leaves petiolate, lanceolate or ovate-lanceolate, acute or acuminate, very rarely on luxuriant shoots broad and obtuse, usually glabrous and smooth on the upper side except minute stellate hairs along the principal veins, mostly 2 to 4in. long. Flowers blue, rather small, in lateral racemes, the common peduncle very short, the pedicels lengthening to about  $\frac{1}{2}$ in. or even 1in. under the fruit. Calyx under 2 lines long when in flower, with narrow acuminate lobes, somewhat lengthened under the fruit and then often divided to near the base. Corolla usually under  $\frac{1}{2}$ in. diameter, deeply divided into narrow lobes. Anthers connivent and tapering upwards. Berry red, globular, small.—*R. Br.* 445; *Dun. in DC. Prod.* xiii. part i. 191.

Hab.: Keppel Bay, *R. Brown*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller*, and others; Rockhampton, *Dallachy* and others; Rockingham Bay, *Dallachy*; Araucaria Ranges, Burnett River, *F. v. Mueller*; Armadilla, *Barton*; Wawick, *Beckler*.

Some specimens from the Araucaria Ranges, Burnett River, *F. v. Mueller*, sent by him as a var. *lucorum*, have the leaves sprinkled on the upper surface with a few stellate hairs. Brown's Keppel Bay specimens have a more rufous tomentum, showing some approach to *S. furfuraceum*, but very much more glabrous on the upper surface of the leaves.—*Benth.*

Var. ? *magnifolium*. Leaves broadly ovate, 4 to 8in. long, mostly sinuate, with several prickles on the upper side. Flowers very few in the imperfect specimens seen, but quite those of *S. stelligerum*.—Murray River, Rockingham Bay, *Dallachy*; mountain brush, Moreton Bay, *Leichhardt* (both in *Herb. F. v. Mueller*).—*Benth.*

13. **S. parvifolium** (small-leaved), *R. Br. Prod.* 446; *Benth. Fl. Austr.* iv. 451. A bushy slender shrub, closely allied to the small-leaved varieties of *S. stelligerum*, but the leaves are narrow-oblong or almost linear, always obtuse, quite entire or with a short broad lobe on each side near the base, glabrous above, stellate-tomentose underneath, in some specimens not above 1in. long, in others twice as long. Flowers blue, like those of *S. stelligerum*. Calyx about 1 line long when in flower and not 2 lines when in fruit, deeply divided into acuminate lobes. Corolla deeply lobed. Berry small, globular.—*Dun. in DC. Prod.* xiii. part i. 191; *S. leptophyllum*, *F. v. M. Fragm.* ii. 164.

Hab.: Broadsound, *R. Brown*; Brigalow scrub on the Mackenzie and Suttro Rivers, *F. v. Mueller*; in the interior, *Mitchell*; Cape River, *Bowman*; Armadilla, *Barton* (with rather larger flowers).

14. **S. ferocissimum** (numerous prickles), *Lindl. in Mitch. Three Exped.* ii. 58; *Benth. Fl. Austr.* iv. 451. A low straggling slender shrub, allied to *S. parvifolium*, the branches rather loosely stellate-tomentose. Prickles long and slender, very numerous on the branches and leaves, none on the calyx. Leaves linear or linear-lanceolate, not so obtuse as in *S. parvifolium*, entire or the larger ones hastately lobed at the base, 1 to 2in. long, glabrous or with loose stellate hairs especially underneath, without the close tomentum of *S. parvifolium*. Flowers small, blue, in loose racemes, with a very short common peduncle and slender pedicels. Calyx 1 to  $1\frac{1}{2}$  line long in flower, somewhat enlarged in fruit, deeply divided into acuminate lobes. Corolla about  $\frac{1}{2}$ in. diameter, deeply lobed.—*Dun. in DC. Prod.* xiii. part i. 373.

Hab.: Southern localities.

15. **S. sporadotrichum** (hairs scattered), *F. v. M. in Melb. Chemist*, Oct. 1882. A shrubby plant, the branches almost glabrous, but copiously armed with short slender prickles. Leaves nearly ovate in outline, green on both sides, margins undulate, the whole more or less covered with stellate hairs. Racemes short. Calyx-lobes narrow. Corolla white.

Hab.: Mount Dryander.

16. **S. defensum** (armed with prickles), *F. v. M. Fragm.* v. 193; *Benth. Fl. Austr.* iv. 451. The single specimen described is an erect nearly simple shoot from a woody stock (or from the base of a shrub that has been cut down), stout and rigid, above 1½ ft. high, scabrous with scattered stellate hairs. Prickles straight, rather numerous on the stem and leaves, none on the calyxes. Leaves very shortly petiolate, oblong-lanceolate, acuminate, pinnatifid with short obtuse lobes or some sinuate only, 3 to 5 in. long, green on both sides, glabrous above, with a few small scattered stellate hairs underneath. Flowers blue, rather small, resembling those of *S. stelligerum*, in loose lateral racemes, the pedicels rather long even when in flower. Calyx-lobes acuminate, split almost to the base, but not exceeding 2 lines with the fruit far advanced. Corolla about ½ in. diameter, deeply lobed. Anthers tapering upwards. Berry small, globular, but not quite ripe in the specimen.

Hab.: Cape York, *Dumet* (Herb. F. v. Mueller).

Very remarkable in the foliage, but that may have been in some measure modified by the circumstances of growth of the only specimen known.—*Benth.*

17. **S. violaceum** (flowers violet), *H. Br. Prod.* 445; *Benth. Fl. Austr.* iv. 452. An erect shrub of several feet, the branches under side of the leaves and inflorescence covered with a stellate tomentum, sometimes dense and close, more rarely loose and floccose. Prickles slender, straight, not numerous, on the branches and sometimes on the upper side of the leaves, none on the calyxes. Leaves petiolate, lanceolate or ovate-lanceolate, acute or rather obtuse, entire or rarely sinuate, often oblique at the base but not cordate, mostly 2 to 4 in. long, glabrous on the upper surface or rarely scabrous with small stellate hairs. Flowers violet, large, in lateral racemes, the common peduncle at first very short, as well as the pedicels, but both sometimes much lengthened in fruit. Calyx above 2 and often 3 lines long, with acuminate teeth sometimes very short sometimes as long as the tube, somewhat enlarged and more deeply lobed when in fruit. Corolla ¾ to above 1 in. diameter, the lobes short and very broad. Berry globular, larger than in *S. stelligerum*—*Dun. in DC. Prod.* xiii. part i. 336; *S. Brownii*, *Dun. Hist. Solan.* 201.

Hab.: Southern localities.

The species sometimes resembles some forms of *S. stelligerum* in foliage, but is at once distinguished by the large and differently shaped calyx and corolla.—*Benth.*

18. **S. amblymerum** (parts of flower obtuse), *Dun. in DC. Prod.* xiii. part i. 294; *Benth. Fl. Austr.* iv. 452. An erect shrub of several feet, the branches under side of the leaves and inflorescence covered with a dense stellate tomentum usually close. Prickles slender, straight, on the branches and often on the leaves, none on the calyxes. Leaves shortly petiolate, narrow-lanceolate or almost linear, rather obtuse, entire or with short obtuse lobes near the base, 2 to 4 in. long, the upper surface glabrous and smooth or slightly scabrous with minute scattered stellate hairs. Flowers large like those of *S. violaceum*, in lateral racemes, usually more numerous than in that species, with the common peduncle more developed. Calyx about 3 lines long when in flower, with small acuminate teeth, enlarged and more lobed after flowering. Corolla fully ¾ in. diameter with short broad lobes. Anthers tapering upwards. Ovary 2-celled. Berry globular.

Hab.: Warwick, *Beckler*, and other southern localities.

I found the ovary 2-celled only in all the flowers I examined. They may possibly, however, prove to be a narrow-leaved variety of *S. violaceum*.—*Benth.*

19. **S. tetrahecum** (ovary 4-celled), *F. v. M. Fragm.* ii. 165 (*partly*); *Benth. Fl. Austr.* iv. 453. A straggling shrub, the branches under side of the leaves and inflorescence covered with a close but dense and soft stellate tomentum. Prickles few on the branches, and in some specimens none.

Leaves petiolate, ovate oblong or oblong-lanceolate, very obtuse, slightly cordate at the base, 1 to 3 in. long, the upper side glabrous or sprinkled with scattered stellate hairs. Flowers rather large, few together in lateral racemes, the pedicels at first very short, lengthening to about  $\frac{1}{2}$  in. Calyx about 2 lines long, with minute teeth, scarcely enlarged but somewhat lobed when in fruit. Corolla deeply lobed, about  $\frac{3}{4}$  in. diameter, of a rather firm consistence. Anthers tapering upwards. Ovary 4-celled, as well as the globular berry.

Hab.: Araucaria Ranges, Burnett River, *F. v. Mueller*.

The ovary and fruit in this are probably, as in other species, dicarpellary, but each carpel divided by a spurious dissepiment, as in some *Convolvulaceæ* and most *Boraginæ*.—*Benth.*

**20. *S. elachophyllum*** (leaves small). *F. v. M. Fragm.* ii. 164; *Benth. Fl. Austr.* iv. 453. A slender straggling shrub, the branches and foliage hoary or silvery with a very close stellate tomentum, less white on the upper side of leaves. Prickles slender, abundant on the branches, none on the leaves or calyxes. Leaves ovate obovate or broadly oblong, narrowed into a very short petiole, entire, 3 to 5 or rarely 6 lines long. Flowers solitary or few together in short lateral racemes. Calyx when in flower about 1 line long with small teeth, enlarged and more divided when in fruit. Corolla violet, about  $\frac{1}{2}$  in. diameter, deeply lobed. Berries globular, variegated, nearly  $\frac{1}{2}$  in. diameter, the fruiting pedicels  $\frac{1}{2}$  in. long.

Hab.: Between Mackenzie and Dawson Rivers, *F. v. Mueller*.

Differs from all other Australian *Solanum*s in its small leaves.—*Benth.*

**21. *S. orbiculatum*** (leaves round), *Dun. in Poir. Dict. Suppl.* iii. 762, and in *DC. Prod.* xiii. part i. 292. A scrubby irregularly spreading shrub. The branches, foliage, and inflorescence clothed with a close dense stellate tomentum. Prickles slender, straight, scattered, none on the leaves or calyxes. Leaves very shortly petiolate orbicular, or very broadly and obscurely cordate, obtuse, more or less undulate, thick, scarcely exceeding  $\frac{1}{2}$  in. in diameter, tripli-quintuplinervate. Flowers very few together in lateral racemes; the common peduncle often very short or attaining 1 in. in length: pedicels also short and slender, not exceeding when in fruit more than 3 lines. Calyx membranaceous, cup-like; the lobes of very irregular size, reaching nearly to the base. Corolla densely tomentose, blue, deeply lobed; lobes broad and blunt, expanding to a little over  $\frac{1}{2}$  in. in diameter. Stamens 5; filaments very short and slender; anthers glabrous, linear-oblong, about 2 lines long, opening by terminal pores. Berry globular, about 3 lines in diameter, brown, nearly or quite glabrous; seeds large, glossy, chestnut colour, the dried pulp amber-coloured and very bitter.—*S. oligacanthum*, *F. v. M. in Trans. Phil. Soc. Vict.* i. 19; *Benth. Fl. Austr.* iv. 454

Hab.: Annandale, Eyre's Creek, *Dr. Thos. L. Bancroft*. The above description is given from the Annandale specimens.

**22. *S. esuriale*** (fruit eaten), *Lindl. in Mitch. Three Exped.* ii. 43; *Benth. Fl. Austr.* iv. 454. "Oon-doroo," Cloncurry, *Palmer*. A low shrub, often under 6 in. high and rarely exceeding 1 ft., the branches inflorescence and both sides of the leaves covered with a close but dense and soft stellate tomentum, rarely somewhat looser underneath. Prickles few and slender on the stems or the whole plant unarmed. Leaves petiolate, ovate oblong, or lanceolate, obtuse, entire or sinuate-toothed, mostly  $\frac{3}{4}$  to 1 in. long, but in luxuriant specimens narrow-lanceolate entire and 2 to 3 in. long. Flowers solitary or 2 to 4 together, on a very short lateral common peduncle, the pedicels lengthening to  $\frac{1}{2}$  in. Calyx under 2 lines when in flower with narrow almost acute teeth, enlarged after flowering and dividing into triangular acuminate lobes. Corolla blue,

$\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, deeply lobed. Anthers tapering upwards. Berry globular.—Dun. in DC. Prod. xiii., part i. 373; *S. pulchellum*, F. v. M. in Trans. Phil. Soc. Vict. i. 18, and in Hook. Kew Journ. viii. 166.

Hab.: Ranges about Lake Salvator, *Mitchell*; Upper Burdekin River, *F. v. Mueller*; Suttor and Bowen Rivers, *Bowman*; Armadilla and Curriwillingham, *Barton*.

Fruit eaten raw or roasted, *Palmer l.c.*

**23. *S. chenopodium*** (Chenopodium-like), *F. v. M. Fragm.* ii. 165; *Benth. Fl. Austr.* iv. 454. A slender divaricate shrub of 2 to 3 ft., with the close stellate tomentum of *S. esuriale*, which however sometimes almost disappears from the upper surface of the old leaves. Prickles slender, few or rarely more numerous on the branches, very rare on the leaves and none on the calyxes. Leaves petiolate ovate lanceolate or lanceolate, the broader ones cordate at the base, rather obtuse, sinuate-lobed towards the base and sometimes hastate, mostly 1 to 2 in. long. Flowers few in short lateral racemes. Calyx scarcely  $1\frac{1}{2}$  line long when in flower with very small teeth, more deeply lobed but scarcely above 2 lines long when in fruit. Corolla blue, about  $\frac{1}{2}$  in. diameter, the lobes rather broad and short. Berry globular, shining, rather small.

Hab.: Georgina River and other inland localities.

The species differs from *S. esuriale* in its taller stature, mostly lobed or hastate leaves, and apparently in the form of the corolla.—*Benth.*

**24. *S. Sturtianum*** (after Capt. Chas. Sturt), *F. v. M. in Trans. Phil. Soc. Vict.* i. 19, and in Hook. Kew Journ. viii. 166; *Benth. Fl. Austr.* iv. 454. An erect shrub with the close stellate tomentum and rare prickles of *S. esuriale*, but apparently of taller stature. Leaves petiolate, oblong or lanceolate, obtuse, entire or scarcely sinuate,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long. Peduncles usually rather longer than in *S. esuriale*, bearing a short raceme of very few rather large flowers, the pedicels very short at the time of flowering but lengthening afterwards. Calyx about 2 lines long when in flower, with short acute teeth, much enlarged and irregularly lobed when in fruit. Corolla  $\frac{3}{4}$  to 1 in. diameter, with short broad lobes. Anthers tapering upwards. Berry black, above  $\frac{1}{2}$  in. diameter.

Hab.: Gulf country

The species differs from *S. esuriale* chiefly in the large slightly lobed corolla.—*Benth.*

**25. *S. furfuraceum*** (scurfy), *R. Br. Prod.* 446 (the char. wrong as to the leaves by a clerical error); *Benth. Fl. Austr.* iv. 455. An erect spreading shrub of 4 to 6 ft., the branches and inflorescence covered with a rather loose rusty tomentum. Prickles straight, slender, not numerous on the branches, very rare on the leaves and none on the calyxes. Leaves petiolate, ovate or ovate-lanceolate, acute, acuminate or almost obtuse, entire or sinuate, rounded or slightly cordate at the base, not above 2 in. long, more or less scabrous above with stellate hairs sometimes very dense, densely tomentose underneath and often woolly or floccose. Flowers blue in rather dense lateral racemes, the pedicels short. Calyx divided almost to the base into narrow acuminate lobes, above 2 lines long at the time of flowering, 4 to 6 lines when in fruit. Corolla rather large, divided to near the middle into broad lobes. Berry globular, much larger than in *S. stelligerum*, the enlarged calyx-segments broadly lanceolate, subulate-acuminate.—Dun. in DC. Prod. xiii., part i. 293.

Hab.: Broadsound, *R. Brown*; Brisbane River, Moreton Bay, *Fraser*, *F. v. Mueller*; Mogill scrub, *C. Stuart*; Rockhampton, *Dallachy*, *O'Shanesy*; Table Mountain, *Bowman*.

**26. *S. dianthophorum*** (flowers usually in pairs), *Dun. Hist. Sol.* 183, and in DC. Prod. xiii. part i. 192; *Benth. Fl. Austr.* iv. 455. Perhaps a variety only of *S. furfuraceum*, with the same indumentum, but a more spreading slender shrub without any prickles at all or very rarely with a very few small slender prickles on the stem. Leaves as in *S. furfuraceum*, ovate or ovate-lanceolate



entire or slightly sinuate, rarely above 1in. long. Flowers solitary or two together on slender pedicels rarely above  $\frac{1}{2}$ in. long. Calyx of *S. furfuraceum*. Corolla rather smaller. Anthers much acuminate. Berry like that of *S. furfuraceum*.—*S. biflorum*, R. Br. Prod. 445, not of Lour.

Hab.: Bay of Inlets, Banks and Solander; Port Bowen, R. Brown; Perry Islands, A. Cunningham.

27. **S. Dallachii** (after J. Dallachy), *Benth. Fl. Austr.* iv. 456. "Koori," Bundaberg, *Keys*. An erect stout shrub of 6 to 10ft., the branches inflorescence and foliage densely villous with loose velvety hairs mostly stellate at the base. Prickles slender, very rare on the branches and leaves, none on the inflorescence. Leaves broadly ovate, acuminate, the longer ones 6 to 8in. long and 4 to 5in. broad, and mostly sinuate-toothed, the smaller ones entire and resembling those of *S. densevestitum*. Peduncles axillary, often longer than in the allied species, bearing a short raceme almost contracted into an umbel and sometimes forked. Pedicels under  $\frac{1}{2}$ in. long when in flower, nearly 1in. when in fruit. Calyx at the time of flowering nearly 3 lines long, with narrow acuminate teeth or lobes, somewhat enlarged in fruit, and then deeply divided into lanceolate subulate-acuminate lobes. Corolla blue, deeply lobed, about  $\frac{1}{2}$ in. diameter. Anthers tapering upwards. Berry yellow, globular, 1in. or more in diameter, glabrous.—*S. repandum*, F. v. M. *Fragm.* vi. 145, not of Forster.

Hab.: Rockingham Bay, *Dallachy*, and other tropical localities.

28. **S. densevestitum** (densely hairy), *F. v. M. in Herb. Hook.*; *Benth. Fl. Austr.* iv. 456. An erect shrub of several feet, the branches inflorescence and foliage densely villous with loose velvety-stellate hairs sometimes more tomentose but very soft and almost floccose. Prickles slender, very few or rarely rather numerous on the stems, very rare on the leaves and none on the inflorescence or calyxes. Leaves ovate or ovate-lanceolate, rather obtuse, entire or slightly sinuate, often somewhat cordate, thick and soft, 2 to 3in. long. Flowers solitary or very few in short almost sessile lateral racemes, the pedicels also short. Calyx hispid, divided to the base into lanceolate acute segments about 3 lines long at the time of flowering, longer when in fruit. Corolla about  $\frac{3}{4}$  to 1in. diameter, rather deeply divided into broad lobes.

Hab.: Araucaria Ranges, Upper Burnett River, *F. v. Mueller*; Brisbane River, Moreton Bay, *F. v. Mueller and others*; Mount Lindsay, *C. Moore*; also in *Leichhardt's* collection.

29. **S. nemophilum** (grove-loving), *F. v. M. Fragm.* ii. 161; *Benth. Fl. Austr.* iv. 456. A low spreading shrub, the branches inflorescence and foliage covered with a soft thick stellate tomentum. Prickles none or probably rare on the branches. Leaves ovate oblong or almost lanceolate, rather obtuse, entire, rounded or slightly cordate at the base, thick and soft, 1 to 2in. long. Flowers violet, solitary or 2 or 3 together on a very short lateral common peduncle, the pedicels at length nearly  $\frac{1}{2}$ in. long. Calyx divided to the base into narrow obtuse thick and woolly segments, 2 to 3 lines long when in flower and but slightly enlarged when in fruit. Corolla above  $\frac{1}{2}$ in. diameter, deeply lobed. Berry red, ovoid.

Hab.: Ironbark forest between the Mackenzie and Dawson Rivers, *F. v. Mueller*; Burnett River, *Haly*; Flinders River, *Sutherland*; Brisbane River.

The species is very near the last three, but the calyx-segments remarkably obtuse, besides the differences in foliage and indumentum.—*Benth.*

30. **S. semiarmatum** (half-armed), *F. v. M. Fragm.* ii. 163; *Benth. Fl. Austr.* iv. 457. An erect shrub, the branches and inflorescence covered with a dense hoary or white stellate tomentum sometimes floccose. Prickles slender, straight, very numerous on the branches and on the peduncles, very rare on the leaves and none on the calyxes. Leaves petiolate, ovate or ovate-lanceolate and

scarcely lobed when small, the larger ones broad and pinnatifid with triangular or lanceolate lobes, green, but softly tomentose on the upper side, very white-tomentose underneath, 2 to 4 in. long. Flowers numerous in loose pedunculate lateral simple racemes or more frequently branched cymes, usually as long as the leaves. Pedicels slender,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long at the time of flowering. Calyx turbinate, about 2 lines long, the lobes almost obtuse to subulate-acuminate, longer than the tube, enlarged after flowering and sometimes separating to the base. Corolla  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, divided to below the middle. Anthers tapering upwards. Berry globular.

Hab.: In the interior, *Mitchell*: Darling Downs, *Law*: Connor's River, *Bowman*.

The leaves usually scarcely lobed, although a few are larger and more lobed, showing the connection with the typical specimens. The species forms a passage from the third to the fourth group, the prickles being abundant on the peduncles, but the calyxes entirely unarmed.—*Benth*.

31. \****S. pyracanthum*** (fire-spined), *Lam. Illus.* The young growth stellate-tomentose, midrib of leaves and spines reddish. Leaves, lobes almost entire, acutish, the recesses obtuse. Prickles straight. Petioles, peduncles, pedicels and calyxes prickly and dotted with white tomentum. Racemes few-flowered. Calyx rusty, segments ovate-subulate. Corolla bluish-violet, marked by a paler star inside the centre and by a pale-green star outside. Berry globose, yellowish, at length brown.

Hab.: Madagascar. Met with as a stray from garden culture.

32. ***S. sodomæum*** (Sodom's Apple), *Linn.*; *Dun. in DC. Prod.* xiii., part i. 366; *Benth. Fl. Austr.* iv. 458. A spreading or diffuse shrub or herb of 2 to 3 ft., the foliage green but sprinkled as well as the branches with a few small stellate hairs. Prickles stout, often thickened downwards on the stem and leaves, more slender on the calyxes. Leaves deeply pinnatifid, with very obtuse rounded obovate or spatulate lobes, often sinuate, the whole leaf 3 to 6 in. long. Racemes pedunculate, few-flowered, short and simple or rarely once-forked. Calyx divided to the middle into obtuse lobes. Corolla rather large, divided to near the middle into broad lobes. Berries globular, rather large, variegated green and white or at length yellow.—*Sibth. Fl. Græc.* t. 235.

Hab.: A native of the Mediterranean region and of S. Africa, early introduced into New South Wales, *R. Brown*, and now naturalised in Queensland.

33. \****S. aculeatissimum*** (very prickly), *Jacquin, Coll.* i. 100. A spreading shrub, 2 ft. or more high, clothed with simple hairs. Leaves deeply pinnatifid, the nerves bearing stout prickles, about 3 in. long, on petioles of same length. Flowers solitary or in pairs, whitish. Calyx glossy and prickly. Corolla divided to about the middle. Berry a rich scarlet, exceeding 1 in. diameter, within the rind white and somewhat dry. Seeds very flat, golden and reticulate.

Hab.: A South American species, naturalised in many localities.

34. \****S. aculeastrum*** (armed with sharp prickles), *Dunal*. A tall woody shrub often 10 ft. high, all parts even sometimes the fruit armed with stout often curved prickles. Leaves repand or deeply lobed, 3 to 5 in. long, white on the underside from a close tomentum. Flowers solitary. Calyx-lobes short, obtuse, much enlarged under the fruit. Berry large, globose, 1 to 2 in. diameter, glossy and more or less sprinkled with short conical prickles. Rind hard, yellowish. Seed embedded in a green pulp.

Hab.: A South African plant. Introduced many years ago for the purpose of hedge-making, now naturalised in many localities.

35. ***S. xanthocarpum*** (yellow-fruited), *Schrad. and Wend. Sert. Hanov.* i. 8, t. 2; *Clarke, in Hook. Fl. Brit. Ind.* iv. 237. A diffuse herb or undershrub of 2 to 3 ft., quite glabrous except the corolla, or with a very few small stellate

hairs scattered on the young shoots. Prickles slender, numerous on the stems, leaves, inflorescence, and calyxes. Leaves ovate or broadly oblong-lanceolate, acute, sinuate-lobed or pinnatifid, with acute broad or rarely narrow often sinuate lobes, the larger leaves 3 to 4 in. long. Flowers usually 2 or 3 but sometimes more numerous in loose lateral racemes, the common peduncle more or less elongated above the lowest pedicel, the pedicels rather long. Calyx 4 to 5 lines long at the time of flowering, with lanceolate acuminate lobes, and scarcely enlarged afterwards. Corolla  $\frac{3}{4}$  to 1 in. diameter, stellate-pubescent outside, the lobes not very deep, acute or sometimes much dilated and obtuse. Filaments short; anthers scarcely tapering upwards. Berry globular, variegated, above  $\frac{1}{2}$  in. diameter.—Dun. in DC. Prod. xiii., part i. 295; *S. hystrix*, Dun. l.c. 296 and some others, but not of R. Br.; *S. pungetium*, Sieb. Pl. Exs. not of R. Br.; *S. armatum*, R. Br. Prod. 446; Benth. Fl. Austr. iv. 458.

Hab.: Near Warwick, *Beckler*, and other southern localities.

36. ***S. pungetium*** (sharp prickles), *R. Br. Prod.* 446; *Benth. Fl. Austr.* iv. 459. A diffuse herb, the branches foliage and inflorescence sprinkled with stellate hairs, without any glandular pubescence. Prickles slender but not very long, rather numerous on the branches, leaves, inflorescence, and calyxes. Leaves petiolate, from broadly ovate to almost oblong, irregularly sinuate-lobed, with short and broad but acute and sinuately toothed lobes, green on both sides, the larger leaves 2 to 4 in. long. Flowers lateral, solitary or 2 together, each on a slender pedicel without any common peduncle. Calyx 3 to 4 lines long, with narrow acuminate lobes, slightly enlarged when in fruit. Corolla of a bluish-violet, about  $\frac{3}{4}$  in. diameter, with rather broad and short triangular lobes. Berry globose, about 1 in. diameter, variegated.—Dun. in DC. Prod. xiii., part i. 295.

Hab.: Bowen River, *Bowman*; Burnett River to Rockingham Bay (*F. v. Mueller*).

The species resembles some forms of *S. xanthocarpum*, but, besides the indumentum, the inflorescence pointed out by Brown appears to be constant. In *S. xanthocarpum*, when the raceme is reduced to 2 flowers, if one pedicel is sessile on the stem the other is always raised on a peduncle.—*Benth.*

37. ***S. eremophilum*** (Eremophila-like), *F. v. M. in Linnaea*, xxv. 432; *Benth. Fl. Austr.* iv. 459. A perennial or undershrub, either small and diffuse or tall and erect, the branches foliage and inflorescence hirsute with stellate hairs but scarcely tomentose. Prickles rigid and rather long on the stem, leaves, and calyxes. Leaves petiolate, broadly ovate, obtuse, undulate and broadly sinuate-lobed, green on both sides, scarcely above 1 in. long. Racemes short and few-flowered, the pedicels at length above  $\frac{1}{2}$  in. long. Calyx broadly campanulate, about 3 lines long at the time of flowering, divided to below the middle into broadly lanceolate membranous lobes, much enlarged after flowering. Corolla about  $\frac{3}{4}$  in. diameter, with broad acute lobes not reaching to the middle. Anthers tapering upwards. Berry globular, almost covered by the enlarged slightly prickly calyx.

Hab.: Southern localities.

38. ***S. campanulatum*** (campanulate flowers), *R. Br. Prod.* 446; *Benth. Fl. Austr.* iv. 460. A coarse erect herb (or undershrub?) of 2 to 3 ft., the branches foliage and inflorescence more or less hirsute with stellate or simple hairs mixed with a glandular pubescence. Prickles straight, rather slender, numerous on the stem, leaves and inflorescence, few and small on the calyxes. Leaves petiolate, ovate, sinuate-lobed, with short, broad angular or sinuate lobes or rarely more deeply pinnatifid, green on both sides, 2 to 4 in. long. Flowers few, in loose lateral racemes, the pedicels at length above 1 in. long and distant along the common peduncle. Calyx 4 to 5 lines long, with subulate-acuminate lobes, enlarged in fruit and deeply divided into lanceolate acuminate segments. Corolla violet or blue, broadly campanulate or sometimes almost rotate, but

always less open than in other Australian species, about 1in. diameter, very shortly and broadly lobed. Anthers but slightly tapering upwards. Berry globular,  $\frac{3}{4}$  to 1in. diameter, surrounded by but not completely enclosed in the enlarged prickly calyx.—Dun. in DC. Prod. xiii., part i. 297; Bot. Mag. t. 3672.

Hab.: Araucaria Ranges, Burnett River, and other southern localities.

39. **S. adenophorum** (gland-bearing), *F. v. M. Fragm.* ii. 162; *Benth. Fl. Austr.* iv. 460. An erect perennial, sometimes under 1ft. and from that to 2ft. high, the branches foliage and inflorescence hirsute with simple or stellate hairs mixed with a glandular pubescence. Prickles slender, rather numerous on the branches, leaves, inflorescence and calyxes. Leaves petiolate, ovate, sinuately lobed or pinnatifid with rather obtuse sinuate lobes, green on both sides, 2 to 4in. long. Flowers rather small, pale-blue or white, in loose racemes on rather long peduncles. Calyx 2 to 4 lines long at the time of flowering, deeply divided into narrow subulate-acuminate lobes, enlarged in fruit and the points then very long. Corolla glabrous or with a very few stellate hairs outside, about  $\frac{1}{2}$ in. diameter, deeply divided into narrow lobes. Anthers rather long, tapering upwards. Berry whitish, globular, scarcely  $\frac{1}{2}$ in. diameter.

Hab.: Barren hills between the Mackenzie and Dawson Rivers, *F. v. Mueller* (with most of the leaves rather deeply lobed); Rockingham Bay, *Dallachy* (leaves mostly sinuate-toothed or shortly lobed).

40. **S. cinereum** (grey), *R. Br. Prod.* 446; *Benth. Fl. Austr.* iv. 460. An erect undershrub, the branches and inflorescence stellate-tomentose. Prickles slender, numerous on the branches, leaves, inflorescence, and calyxes. Leaves petiolate, ovate or ovate-lanceolate, mostly acuminate, more or less deeply sinuate-lobed or pinnatifid, 2 to 5in. long, green above and glabrous or sprinkled with a few minute stellate hairs, white underneath with a soft stellate often floccose tomentum. Flowers blue, rather large, in pedunculate racemes often as long as the leaves, the pedicels at first short, much elongated in fruit. Calyx 3 to 4 lines long, somewhat enlarged after flowering, densely prickly, with acuminate lobes. Corolla nearly 1in. diameter, with short broad acute lobes. Berry globular,  $\frac{3}{4}$  to 1in. diameter.—Dun. in DC. Prod. xiii., part i. 294.

Hab.: Southern inland localities.

*S. semiarmatum* has sometimes the aspect of this species, but is readily known by the small calyx with short teeth and without prickles, and by the more numerous smaller flowers.—*Benth.*

41. **S. carduiforme** (Cardoon-like), *F. v. M. Fragm.* ii. 163; *Benth. Fl. Austr.* iv. 462. An erect herb of 1 to 3ft., of a pale glaucous green, covered with a stellate tomentum rather loose on the branches, very short and not dense on both sides of the leaves. Prickles rather slender but long and very numerous on the branches, leaves, and especially on the female calyxes. Leaves narrow, irregularly pinnatifid, with rather narrow obtuse entire or sinuate lobes, the whole leaf 3 to 4in. long. Sterile flowers numerous, in dense racemes on long lateral peduncles. Calyx at the time of flowering about 3 lines long, campanulate, with broad lobes. Corolla not large. Fertile flowers probably solitary on lateral peduncles, which are still very short in fruit. Fruiting calyx large, globular, very densely armed with long rigid prickles, enclosing a globular berry of  $\frac{1}{2}$ in. or more.

Hab.: Gulf of Carpentaria, *F. v. Mueller*.

42. **S. echinatum** (echinate), *R. Br. Prod.* 447; *Benth. Fl. Austr.* iv. 463. An erect or diffuse undershrub, the branches foliage and inflorescence very densely and softly stellate-tomentose, often velvety or floccose. Prickles slender, rather small on the stems, few or none on the leaves, more abundant and longer on the calyxes. Leaves on rather long petioles, ovate oblong or lanceolate, obtuse, entire or slightly sinuate, very thick and soft, mostly 1 to 2in. long.

Racemes lateral, loose, the common peduncle elongated. Flowering calyx 2 to 3 lines long, with short lanceolate lobes, very tomentose, with small prickles; when in fruit globular, membranous, very prickly, about  $\frac{3}{4}$  in. diameter, completely enclosing the globular berry, the broad triangular lobes almost meeting over it. Corolla very tomentose,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, shortly and broadly lobed.—Dun. in DC. Prod. xiii., part i. 297.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

According to *R. Brown* the berry is almost 4-celled (*subquadrilocularis*), which I have been unable to verify in our specimens. In two flowers that I examined I found the ovary 2-celled only, but with slight indications of transverse spurious dissepiments, which may probably grow out as the fruit enlarges.—*Benth.*

43. **S. ellipticum** (elliptic), *R. Br. Prod.* 446; *Benth. Fl. Austr.* iv. 464.

A shrub or undershrub, either very low and spreading or taller and erect, the branches foliage and inflorescence covered with a dense stellate tomentum, sometimes very thick soft and velvety or floccose, sometimes shorter and closer. Prickles slender, few or numerous on the stems and calyxes, few or none on the leaves. Leaves petiolate, from broadly ovate to ovate-lanceolate or oblong, obtuse, entire or slightly sinuate or undulate, rounded or cordate at the base, mostly 1 to nearly 3 in. long. Flowers in lateral racemes, often longer than the leaves, the pedicels usually short. Calyx-tube at the time of flowering 1 to 2 lines long, the lobes or teeth narrow and thick, from very short to fully twice as long as the tube; after flowering the calyx much enlarged and dividing into broad lobes with short or long narrow points. Corolla violet, with short broad lobes, apparently varying in size from about  $\frac{1}{2}$  to about  $\frac{3}{4}$  in. diameter. Ovary 2-celled. Berry globular, surrounded by but not enclosed in the enlarged calyx.—Dun. in DC. Prod. xiii. part i. 298; *S. lithophilum*, *F. v. M.* in *Linnæa*, xxv. 434, and *Fragm.* vi. 145.

Hab.: Broadsound, *R. Brown*; near Peak Range, *Leichhardt*; Suttor desert, Dawson and Mackenzie Rivers, *F. v. Mueller*; Rockhampton, *O'Shanesy*, *Dallachy*; Suttor and Connor Rivers and Nerkool Creek, *Bowman*; Flinders River, *Sutherland*; Maranoa River, *Mitchell*; Armadilla, *Barton*.

44. **S. quadriloculatum** (4-celled), *F. v. M. Fragm.* ii. 161; *Benth. Fl. Austr.* iv. 464. An undershrub attaining several feet, the branches foliage and inflorescence densely and softly stellate-tomentose. Prickles straight, rather slender, long or short, few or many on the stems and calyxes, few or none on the leaves. Leaves petiolate, ovate or ovate-lanceolate, acute or acuminate, entire, very unequal at the base, thick and soft, 2 to 4 or even 5 in. long. Flowers small and numerous, in long lateral racemes (the upper ones sterile?), the pedicels rather short. Calyx-tube campanulate, under 2 lines long, with short or long soft points or lobes, enlarged after flowering and dividing into broad lobes with narrow points. Corolla above  $\frac{1}{2}$  in. diameter, rather deeply lobed. Ovary 4-celled. Berry globular, surrounded by but not enclosed in the enlarged calyx, but not seen quite ripe.

Hab.: Gulf of Carpentaria, *F. v. Mueller*.

### 3. PHYSALIS, Linn.

(Alluding to the inflated calyx.)

Calyx 5-toothed or 5-lobed, inflated after flowering. Corolla broadly campanulate or nearly rotate, 5-angled, folded in the bud. Anthers short, opening longitudinally. Ovary 2-celled. Berry globular, enclosed in the inflated calyx.

Embryo circular or spiral round the fleshy albumen.—Herbs either annual or with a perennial stock. Leaves often in pairs. Flowers solitary, usually small, on axillary or lateral pedicels.

A genus rather numerous in America, of which two or three species, including the Australian one, extend over the warmer regions of the Old World.

Stock perennial, the whole plant softly pubescent . . . . . 1. *P. peruviana*.  
Annual, sparingly pubescent. Flowers very small . . . . . 2. *P. minima*.

1. ***P. peruviana*** (of Peru). *Linn.: Dnn. in DC. Prod.* xiii. part i. 440; *Benth. Fl. Austr.* iv. 466. Cape Gooseberry. A herbaceous perennial of 1 to 2 ft., softly pubescent or tomentose with simple hairs. Leaves petiolate, broadly ovate, acuminate, entire or slightly sinuate-toothed, mostly cordate at the base, 2 to 3 in. long. Pedicels short, rarely  $\frac{1}{2}$  in. long even in fruit, recurved after flowering. Calyx when in flower about 3 lines long, with narrow lobes as long as the tube. Corolla rather above  $\frac{1}{2}$  in. in diameter, pale-yellow with purple spots in the centre. Fruiting calyx vesicular, with connivent teeth, 1 to  $1\frac{1}{2}$  in. long, reticulate, with the principal veins prominent, but not so angular as in *P. minima*. Berry globular, yellow.—*Nees, in Pl. Preiss.* i. 344; *P. pubescens*, *R. Br. Prod.* 447, and of *Linn. Herb.* but not of *Linn. Spec. Pl.*; *P. edulis*, *Sims. Bot. Mag.* t. 1068.

HAB.: Brisbane River to range Trinity Bay.

The species is of South American origin, and perhaps really indigenous in the islands of the Pacific, but long since cultivated for its berries, and established as a weed in several tropical countries.—*Benth.*

2. ***P. minima*** (small). *Linn.: Dnn. in DC. Prod.* xiii. part i. 445; *Benth. Fl. Austr.* iv. 466. "Neen-gwan," Cloncurry, *Palmer*. An erect annual of about 1 ft., with spreading branches, more or less pubescent with scattered simple hairs. Leaves petiolate, ovate, acute or acuminate, irregularly sinuate-toothed or rarely entire, thin and membranous, mostly 2 to 3 in. long. Flowers very small, on filiform pedicels sometimes very short, sometimes above  $\frac{1}{2}$  in. long. Calyx when in flower scarcely  $1\frac{1}{2}$  line long, with short acuminate teeth. Corolla about twice as long as the calyx, pale-yellow, the centre often purple. Fruiting calyx about 1 in. long, vesicular, with 5 prominent angles and acuminate connivent teeth. Berry globular.—*P. parviflora*, *R. Br. Prod.* 447; *Dnn. in DC. Prod.* xiii. part i. 444, with some other supposed species enumerated by *Dunal*; *P. pubescens*, *Wight, Ill.* t. 166b, fig. 6, not of *Linn.*; *Rheede, Hort. Mal.* x. t. 71.

HAB.: B on Island and Keppel Bay, *R. Brown*; Moreton Bay, *Leichhardt, F. v. Mueller*; Rockhampton, *O'Shaughnessy, Dallachy*; Nerakool and Crocodile Creeks, *Bourman*; Rockingham Bay, *Dallachy*; Port Moller, *McGillivray*.

Fruit eaten by natives on Cloncurry, *Palmer*.

Var. *indica*. A taller plant, glabrescent; fruiting calyx 5-anglar.—*Rheede, Hort. Mal.* x. t. 70. This variety has become naturalised in many localities.

The species is dispersed over tropical America, Asia, and Africa, and very common in E. India.

#### 4. CAPSICUM, Linn.

(Supposed to be from the Greek; alluding to the pungent qualities of the fruit.)

Calyx campanulate, subentire or minutely 5-toothed, much shorter than the fruit. Corolla rotate; lobes 5, valvate in the bud. Stamens 5, attached near the base of the corolla. Anthers not longer than the filaments, dehiscing longitudinally. Ovary 2 rarely 3-celled; style linear, stigma subcapitate. Berry very variable in form and size, many-seeded. Seeds discoid or subscabrous. Embryo peripheric.

Species American, but cultivated in all warm countries.

1. **C. fastigiatum** (erect), *Blume; Wight, Ic. t. 1617*. The common Chilli. A tall shrub. Fruit erect, red, about  $1\frac{1}{4}$  in. long, tapering to a blunt point.

Hab.: Naturalised in many scrubs both north and south.

### 5. \*NICANDRA, Gærtn.

(After Nicander, a Greek physician.)

Calyx of 5 distinct broadly cordate segments or sepals, becoming much enlarged and inflated in fruit. Corolla campanulate, with 5 broad short lobes, folded (and perhaps also slightly imbricated) in the bud. Anthers short, opening longitudinally. Ovary 3 to 5-celled. Fruit a berry, enclosed in the enlarged calyx. Embryo curved in a fleshy albumen.—An erect annual, with the habit and foliage nearly of *Physalis*.

The genus is limited to a single species.

1. **N. physaloides** (Physalis-like), *Gærtn. Fruct. ii. 237, t. 141; Dun. in DC. Prodr. xiii. part i. 434; Benth. Fl. Austr. iv. 465*. An erect glabrous annual or biennial, attaining sometimes 5 or 6 ft., but usually smaller. Leaves petiolate, ovate, irregularly sinuate or coarsely toothed or lobed, 3 to 4 in. long or sometimes larger. Flowers pale-blue, solitary, on short pedicels in the upper axils, forming a terminal leafy raceme. Calyx-segments at the time of flowering a little more than  $\frac{1}{2}$  in. long and herbaceous, when in fruit above 1 in. long, thin and much-veined, closely connivent, forming a vesicular calyx with very prominent angles. Corolla nearly 1 in. long. Berry globular, nearly dry.—*Bot. Mag. t. 2458; Atropa physaloides, Linn.; and Physalis daturaefolia, Lam.; Clarke, in Hook. Fl. Brit. Ind. iv. 240.*

Hab.: A native of S. America, which has established itself as a weed in several parts of the warmer regions of the Old World, and may be met with about Brisbane and other southern towns.

### 6. LYCIUM, Linn.

(Name given by Dioscorides to a thorny bush.)

Calyx with 5, rarely 4 teeth, often minutely dividing into 3 to 5 lobes. Corolla more or less funnel-shaped, the tube expanding into a campanulate 5 rarely 4-lobed limb, the lobes imbricate in the bud. Stamens usually unequal, longer or shorter than the corolla; anthers opening longitudinally. Ovary 2-celled. Berry ovoid or globular. Embryo curved or semicircular, in a fleshy embryo.—Shrubs, usually glabrous, the branchlets often spinescent. Leaves entire, usually small, often clustered on the old nodes. Flowers pedicellate, solitary or several together at the ends of the branchlets or in the clusters of leaves.

The genus is widely spread over the temperate and subtropical regions of the world, especially numerous in S. America and S. Africa. The Australian species is endemic.

Leaves clustered at the old nodes, spatulate-oblong, 3 to 4 lines long.

Corolla about 5 lines long. Filaments shorter than the corolla, hairy to about the middle . . . . .

Leaves obanceolate or obovate, 4 to over 12 lines long. Corolla-tube very short. Stamens exserted . . . . .

Leaves linear-oblong, about 1 in. long. Corolla-tube much longer than the lobes. Stamens exserted, glabrous at their base . . . . .

1. *L. australe*.

2. \**L. chinense*.

3. \**L. europæum*.

1. **L. australe** (Australian), *P. v. M. in Trans. Phil. Soc. Vict. i. 20, and Fragm. i. 83; Benth. Fl. Austr. iv. 467*. A scrubby spreading glabrous shrub of 1 to 3 ft., the smaller branchlets often degenerating into spines. Leaves clustered at the old nodes, obovate spatulate or oblong, obtuse, thick and fleshy, about  $\frac{1}{4}$  in.

long. Flowers usually solitary at the nodes, on short recurved pedicels. Calyx scarcely 1 line long, with minute teeth. Corolla white (*F. v. M.*), about 5 lines long, the tube rather slender, gradually dilated upwards, with 5 rarely 4 ovate obtuse lobes of about 1 line in length. Filaments inserted near the base of the tube, the longest nearly as long as the corolla, hairy to about the middle. Berry bright-red (*Fragm.* i. 243), ovate, few or many-seeded, 4 lines long; seeds yellowish, almost 1 line, ovate or renato-orbicular (*Fragm.* ii. 179).

Hab.: Diamantina. *Dr. Thos. L. Bancroft.*

The species has entirely the aspect of some of the small-leaved S. African ones.

2. \***L. chinense** (of China), *Mill.*; *Benth Fl. Austr.* iv. 457; *Dun. in DC. Prod.* xiii., part i. 510, which includes *L. vulgare*, *Dun. l.c.* 509; *Miers, Illustr.* ii. 120, t. 70. A tall glabrous shrub, with long, weak, recurved or pendulous branches. Leaves oblanceolate to obovate,  $\frac{1}{2}$  to 1 in. long or even longer. Corolla with a very short tube and deeply-lobed campanulate limb, the lobes about 3 lines long. Stamens exserted. Berries ovoid or shortly oblong, orange-red.

Hab.: Toowoomba and Brisbane.

3. \***L. europæum** (of Europe), *Linn.* Boxthorn. A spinous nearly glabrous shrub. Leaves linear-oblong, about 1 in. long. Pedicels shorter or equalling the calyx. Calyx about  $1\frac{1}{2}$  line, often subbilabiate, teeth seldom less than 5. Corolla  $\frac{1}{2}$  in. long, from purple to nearly white, lobes not half as long as the tube. Stamens exserted or subincluded; filaments glabrous at their base. Berry 2 lines diameter, subglobose, many-seeded.—*Miers, Ill. S. Amer. Pl.* ii. 95, t. 64, fig. B; *L. serum, orientale, and persicum*, *Miers, l.c.* 95, 99, 100, t. 64, A, B; *L. intricatum*, *Boiss.*; *Miers, l.c.* 98, t. 64, fig. E; *Clarke, in Hook. Fl. Brit. Ind.* iv. 240 and 241.

Hab.: Mediterranean region, W. Asia. Met with in and about some of the southern towns.

## 7. DATURA, Linn.

(An alteration from the Arabic name.)

Calyx slender, circumsciss near the base after flowering. Corolla funnel-shaped, with a long tube and a broad 5-angled or 5-toothed limb, folded in the bud. Ovary 2-celled, each cell incompletely divided into two. Fruit an ovoid or globular capsule, opening in four short valves, and usually beset with prickles. Embryo curved round a fleshy albumen.—Tall, coarse herbs, or, in S. American species, shrubs or soft-wooded trees. Leaves alternate, often in pairs. Flowers solitary, terminal or lateral, usually very large.

A small genus, chiefly American, with 2 or 3 species equally common in, and perhaps indigenous to, the Old World. The Australian species is endemic.—*Benth.*

Capsule reflexed, globular, 1 in. diameter, very prickly . . . . . 1. *D. Leichhardtii*.

Capsule nodding or suberect, subglobular,  $1\frac{1}{4}$  in. diameter, equally spinous on all sides . . . . . 2. \**D. fastuosa*.

Capsule erect,  $1\frac{1}{2}$  in. by 1 in., equally spinous on all sides . . . . . 3. \**D. stramonium*.

1. **D. Leichhardtii** (after Dr. Leichhardt), *F. v. M. in Trans. Phil. Soc. Vict.* i. 20; *Benth. Fl. Austr.* iv. 468. An erect annual of 1 to 3 ft., sparingly pubescent. Leaves petiolate, ovate, acute or shortly acuminate, irregularly sinuate-toothed or lobed, mostly 3 to 4 in. long. Flowers of a pale yellowish-white, on short peduncles either terminal or in the forks, and recurved after flowering. Calyx scarcely above  $\frac{1}{2}$  in. long. Corolla about twice as long as the calyx, the angles produced into short points. Capsule reflexed, globular, about 1 in. diameter, very prickly, resting on the broadly expanded persistent base of the calyx.—*D. alba*, *F. v. M. Fragn.* vi. 144, but scarcely of Nees.

Hab.: Gulf of Carpentaria, *Landsborough*; Gilbert River, *F. v. Mueller*; Comet River, *Leichhardt*; Suttor River, *Dorsay*; Rockingham Bay, *O'Shanesy*; Armadilla, *Barton*.

The Australian plant has more the aspect of the common *D. stramonium* or of *D. ferax*, with the small flowers of the latter, but differs from both in the reflexed capsule.—*Benth.*



2. \***D. fastuosa** (proud), *Linn.*; *Wight, Ic. t.* 1396; *Clarke, in Hook. Fl. Brit. Ind.* iv. 242. A soft-wooded annual of 2 or 3ft. Leaves ovate entire or deeply toothed, very unequal-sided at the base. Calyx 2 or 3in. long; lobes erect, lanceolate. Corolla white, 6 to 7in. long; limb 4 to 5in. diameter, 5 to 6-toothed. Capsule over 1in. diameter, subglobose, spinous.—*Rumph. Herb. Amb.* v., t. 87, fig. 1.

**Hab.**: An Indian weed naturalised in most warm countries. *Mount Perry, J. Keys*: *Charters Towers, C. Plant.*

3. \***D. stramonium** (an abbreviation of the Greek for Mad Apple), *Linn.* Thorn or Mad Apple. A coarse glabrous or farinose puberulous heavy-scented annual, about 2ft. high. Leaves ovate, toothed or sinuate, 4 to 6in. long, 3 to 4in. broad, petioles about 1in. Pedicels none or short. Calyx 1 to nearly 2in. long and 3 or 4 lines broad; lobes 3 lines long, ovate-lanceolate. Corolla 3 to 5in. long, mouth 1 to 3in. broad; lobes 5, linear, 3 lines long. Capsule ellipsoid, 1½in. long, equally spinous on all sides, spines subulate, about 2 lines long.—*Benth. and Trim. Med. Pl. t.* 192; *Stramonium vulgatum*, *Gærtn. Fruct. ii.* 243 t. 132, fig. 4.

**Hab.**: A weed of most warm countries.

Among the specimens of this weed received from correspondents some may belong to the purple-flowered variety: *D. Tatula*, *Willd. Sp. Pl.*

## 8. NICOTIANA, *Linn.*

(After John Nicot, of Nismes.)

Calyx campanulate, 5-lobed, persistent. Corolla with a cylindrical tube, the limb more or less spreading, 5-lobed, induplicate or folded in the bud. Stamens 5, included in the tube, often unequal; anthers 2-celled, opening longitudinally. Ovary 2-celled; stigma broadly 2-lobed. Fruit a capsule opening in 2 bifid valves parallel to the dissepiment which remains attached to the axis. Seeds numerous. Embryo slightly curved, in a fleshy albumen.—Herbs usually erect and coarse. Leaves alternate, entire. Flowers white greenish-yellow or dull-red, in terminal racemes often branching into very loose panicle-like cymes.

An almost entirely American genus.

A tree. Leaves glaucous. Flowers yellow . . . . .	1. * <i>N. glauca</i> .
A large-leaved viscid herb. Flowers funnel-shaped, often pink . . . . .	2. * <i>N. Tabacum</i> .
Slender herb. Leaves on long petioles. Flowers with slender tube . . . . .	3. <i>N. suaveolens</i> .

1. \***N. glauca** (gray), *Graham*. Tree Tobacco. A small tree 15 to 20ft. high. Leaves ovate, often exceeding 5in. in length and 3in. in width, fleshy and glaucous; the petioles often long. Flower panicles drooping, terminal; flowers tubular, greenish-yellow, exceeding 1in. in length.

**Hab.**: Native of Buenos Ayres. Naturalised in a few inland localities.

2. \***N. Tabacum** (a Latin form of Tobacco), *Linn.*; *Gærtn. Fruct. i.* 264 t. 55. The Tobacco. A tall plant. Leaves large, oblong or elliptic, base cuneate. Flower corymbs compound, ultimate branches short. Calyx-teeth 3-angular, lanceolate. Corolla linear-funnel-shaped. Capsule about ¾in. long.—*Benth. and Trimen. Med. Pl. t.* 191.

**Hab.**: Native of America, and met with as a stray from cultivation in most warm countries.

3. **N. suaveolens** (sweet-scented), *Lehm. Hist. Nicot.* 43; *Benth. Fl. Austr.* iv. 469. An erect annual or biennial of 1 to 2ft., more or less pubescent or villous and usually viscid. Lower leaves on long petioles, ovate or spatulate, the upper ones usually narrow and sessile although contracted at the base, but

exceedingly variable, sometimes all cordate and the upper small ones clasping the stem, sometimes all narrow with very few on the stem, the petiole in some specimens dilated at the base, and stem-clasping or shortly decurrent. Flowers sweet-scented, especially at night, of a pure white or greenish outside, in loose terminal racemes often branching into irregular panicles, and exceedingly variable in size, on short or long pedicels. Braets usually small and linear or none under the upper pedicels, but sometimes all larger and leafy. Calyx varying from 3 to 6 lines long, the lobes usually very narrow and as long as the tube. Corolla-tube slender or broad, varying from  $\frac{1}{2}$  in. to 2 in. in length, usually slightly swollen under the throat; limb spreading flat, from  $\frac{1}{2}$  to 1 in. diameter, the lobes short and broad, emarginate obtuse or almost acute, the 2 upper ones usually rather smaller than the others. Filaments adnate high up; anthers ovate or oblong, 4 usually at the throat of the corolla, the fifth much lower down. Capsule ovate, slightly acuminate, rather shorter than the calyx-lobes. Seeds very small and numerous.—Dnn. in DC. Prod. xiii., part i. 565; *N. undulata*, Vent. Jard. Mahn. t. 10; Bot. Mag. t. 673; R. Br. Prod. 447; *N. Australasia*, R. Br. in Tuck. Cong. App. 472. Misc. Works, ed. Benn. i. 158; *N. rotundifolia*, Lindl. Bot. Reg. 1838. Misc. 59; *N. fastigiata*, Nees, in Pl. Preiss. i. 343.

Hab.: Rockhampton and Rockingham Bay, *Dallachy*; Bowen River, *Boeman*; in the interior, *Mitchell*; Curriwillinghi and Armadilla, *Barton*.

According to Dr. T. L. Baneroff, an extract of this plant is very poisonous, in every respect resembling the physiological action of Tobacco (*N. Tabacum*, Linn.). He states that it contains a small amount of nicotine.

Var. *parviflora*. Corolla much under 1 in. long. Leaf-petioles sometimes auriculate, sometimes not. Panicle large and loose.—The common form north and south.

Var. *longiflora*. Corolla-tube at least 2 in. long. Leaves various. Amby Creek and other inland localities.

From Mr. G. L. Debnay, of Monkia, I have a specimen of a form intermediate between var. *parviflora* and var. *longiflora*, which appears to be a more robust plant than either. It might bear the distinctive name of var. *Debnayi*; and I would advise it being used as the mother plant in obtaining a cross between it and some of the cultivated tobaccos.

## 9. PETUNIA. Juss.

(Said to be from *Petun*, the Brazilian name for Tobacco.)

Calyx deeply 5-fid or 5-partite, lobes oblong. Corolla funnel-shaped or salver-shaped. Stamens 5, attached to the corolla-tube at or below the middle, included; filaments filiform. Anthers ovate, often deeply 2-lobed. Disk fleshy. Capsule 2-celled, 2-valved. Seeds numerous, nearly oval, foveolate-rugose.—Viscid-pubescent herbs with entire leaves and solitary flowers either violet or white.

Species American.

Garden forms between the two species, *P. nyctagineiflora*, Juss., and *P. violacea*, Lindl., are often met with near towns as strays from garden culture.

## 10. DUBOISIA, R. Br.

(After Louis Dubois.)

Calyx 5-toothed. Corolla ovate-campanulate, the lobes broad, induplicate in the bud. Stamens 4, didynamous, included in the tube, the upper ones the longest, the fifth uppermost one reduced to a minute rudiment; anthers reniform, turned outwards at least when fully out, the cells confluent at the apex. Stigma slightly dilated and 2-lobed. Fruit an indehiscent berry. Seeds few, curved,

with a crustaceous tubercular-rugose testa; embryo curved, the albumen not copious.—Small glabrous tree. Leaves alternate, entire. Flowers small, in terminal centrifugal panicles.

The genus is, as far as known, limited to 3 species, one extending from E. Australia to New Caledonia.

Leaves from oblong-obovate to oblong-lanceolate.

Stamens included . . . . .	1. <i>D. myoporoides</i> .
Stamens exserted . . . . .	2. <i>D. Leichhardtii</i> .
Leaves narrow-linear . . . . .	3. <i>D. Hopwoodii</i> .

1. **D. myoporoides** (Myoporum-like), *R. Br. Prod.* 448; *Benth. Fl. Austr.* iv. 474. A tall shrub or small tree, quite glabrous. Leaves alternate, from obovate-oblong to oblong-lanceolate, obtuse or rarely acute, entire, contracted into a petiole, 2 to 4 in. long. Panicles terminal, sometimes leafy at the base, usually much branched, broadly pyramidal or corymbose. Bracts minute. Calyx broadly campanulate, with broad obtuse teeth. Corolla about 2 lines long, white or pale-lilac, the lobes rather short and obtuse. Stamens included in the tube. Berry small, black, juicy, nearly globular.—*Endl. Leonogr.* t. 77; *Benth.* in *DC. Prod.* x. 191; *Miers, Illustr.* t. 87; *Notela lignistrina*, *Sieb. Pl. Exs.*

Hab.: Brisbane River, Moreton Bay, *Fraser. F. v. Mueller*; Rockingham Bay, *Dalbychy*. A common tree on the borders of scrubs.

The juice of the leaves and fruit act rapidly on the iris and accommodation of the eye, producing a widely dilated pupil in twenty minutes. This was introduced into practice some years ago by the late Dr. Joseph Bancroft, and continues to be largely used both in Europe and Australia.

The late Rev. Dr. Wm. Woolls, in paper on "The plants of Kurrajong and Tomah (N.S.W.)," reports having heard it stated that "the aborigines make holes in the trunk of this tree and put some fluid in them which, when drunk on the following morning, produces stupor," and that "branches of the tree are thrown into pools for the purpose of intoxicating the eels and bringing them to the surface."

Wood of a light yellow colour, light and firm, easy to work; useful for cabinet-work, carving, &c.—*Bailey's Cat. Ql. Woods* No. 291.

2. **D. Leichhardtii** (after L. Leichhardt), *F. v. M. in Wing's Son. Sci. Rec.* ii. 222. A glabrous shrub or small tree, with the foliage and inflorescence of *D. myoporoides*. Leaves oblong-lanceolate, rather obtuse, entire, narrowed into a petiole, quite flat, 2 to 4 in. long. Panicles terminal, somewhat leafy at the base, broadly pyramidal or corymbose. Bracts very small. Pedicels short. Calyx small, broadly campanulate, with short broad teeth. Corolla-tube nearly 2 lines long, ovate-campanulate, lobes narrow, acuminate, rather longer than the tube. Anthers 1-celled. Fruit an oval black berry, about 3 lines long, containing about 6 reniform granulated seeds about 1 line long.—*Anthocercis? Leichhardtii*, *F. v. M. Fragm.* vi. 142; *Benth. Fl. Austr.* iv. 481.

Hab.: Mount Playfair, *Mrs. Biddulph* (*F. v. M.*)

3. **D. Hopwoodii** (after H. Hopwood), *F. v. M. Fragm.* x. 20. A glabrous tree or shrub. Leaves narrow-linear, acutely acuminate, with the point often recurved, entire, rather thick, narrowed into a short petiole, 2 to 4 in. long. Flowers in short terminal cymes or leafy pyramidal panicles. Bracts minute. Calyx small, broadly campanulate, with obtuse teeth. Corolla-tube campanulate, 3 to 3½ lines long; lobes broad, very obtuse, shorter than the tube. Anthers 1-celled. Berry globose.—*Anthocercis? Hopwoodii*, *F. v. M. Fragm.* ii. 138; *Benth. Fl. Austr.* iv. 480.

Hab.: Georgina River.

The leaves of this shrub is the Pituri of the natives, and chewed by them like tobacco by some whites. The shrub contains an alkaloid analogous to nicotine.—*Dr. J. Bancroft*,

## ORDER LXXXVII. SCROPHULARINEÆ.

Flowers irregular or seldom nearly regular. Sepals 5, either free or more frequently united in a toothed or lobed calyx. Corolla usually 2-lipped, but sometimes nearly regular, with 5 or rarely 4 or more than 5 lobes, more or less imbricate, and in one tribe folded in the bud. Stamens usually 2 or 4, in pairs, inserted in the tube and alternating with the lower lobes of the corolla; the fifth stamen, between the 2 upper lobes, usually deficient or rudimentary or sterile, very rarely perfect; anthers 2-celled or 1-celled by the confluence of the cells or by the abortion of one of them, the cells opening longitudinally. Ovary 2-celled, with several ovules in each cell, attached to a single placenta in the centre of the dissepiment. Style simple with a 2-lobed or rarely entire stigma. Fruit a 2-celled capsule or very rarely an indehiscent berry. Seeds with more or less of albumen, the testa usually reticulate or tubercular-rugose, sometimes crustaceous. Embryo straight or rarely curved.—Herbs or rarely shrubs or small trees. Leaves usually opposite (or verticillate) in the lower part of the plant, alternate higher up, but sometimes all alternate or all opposite, without stipules. Flowers in terminal racemes or cymes, or the lower ones, rarely all, axillary. Bracts small or none besides the floral leaves, bracteoles very rare.

A large Order widely dispersed over every part of the globe.

**SERIES A. Pseudosolanææ.**—Leaves all alternate. Inflorescence simply centripetal. Corolla with the 2 upper lobes exterior in the bud.

**TRIBE I. Verbascææ.**—Corolla rotate. Stamens declinate. Anthers 1-celled. Erect coarse herbs with alternate leaves.

Stamens 5 . . . . . 1.\***VERBASCUM**,  
Stamens 4 . . . . . 2.\***CELSIA**.

**SERIES B. Antirrhinidææ.**—Corolla 5-lobed or 2-lipped, imbricate in the bud, the upper lip or 2 upper lobes outside. Inflorescence centripetal or, in genera not Australian, compound. (Estivation uncertain in some of the minute-flowered Limosellææ.)

**TRIBE II. Calceolaridææ.** The lower leaves sometimes opposite. Corolla-tube scarcely any, 2-lipped, concave or slipper form. Stamens 2.

Herbs undershrubs or shrubs. The one met with in Queensland an annual weed . . . . . 3.\***CALCEOLARIA**.

**TRIBE III. Antirrhinææ.**—Corolla tubular at the base, the tube produced into a spur or protuberance. Stamens ascending, included in the tube. Capsule opening in pores or detached opercula. Lower leaves or all opposite.

Corolla spurred (prostrate pubescent annual) . . . . . 4.\***LINARIA**.

**TRIBE IV. Gratiolææ.**—Corolla tubular at the base, neither spurred nor gibbous. Stamens shorter than the corolla, ascending. Capsule opening in 2 or 4 valves, or very rarely indehiscent.

**SUBTRIBE I. Mimulææ.**—Calyx 5-toothed or fid. Stamens 4, all perfect  $\frac{\pi}{2}$  included; anther-cells contiguous. Capsule loculicidally 2 to 4-valved or indehiscent.

Calyx tubular, 5-angled, 5-toothed. Anther-cells contiguous . . . . . 5. **MIMULUS**.  
Calyx campanulate, 5-lobed. Anther-cells contiguous . . . . . 6. **MAZUS**.

**SUBTRIBE II. Stemodidææ.** Calyx 5-partite. Stamens 4, all perfect, included; anther-cells separate.

Calyx divided to the base or nearly so. Anther-cells more or less stipitate or separated from each other.

Dissepiment of the capsule splitting and forming the inflexed margins  
of the valves, leaving the two placentas free and separate.

Anthers of the longer stamens 1-celled . . . . . 7. **ADENOSMA**  
Anthers all 2-celled . . . . . 8. **STEMODIA**.

Dissepiment of the capsule splitting, but leaving the placentas consolidated in a single column . . . . . 9. **MORGANIA**.

Dissepiment of the capsule remaining entire, at least at the base, and forming wings to the placental column . . . . . 10. **LIMNOPHILA**.

SUBTRIBE III. **Herpestideæ**.—*Calyx 5-partite, imbricate. Stamens included; anther-cells contiguous. Capsule 2 to 4-valved.*

- Calyx divided to the base, the outer segment much broader than the others. Anther-cells contiguous . . . . . 11. **HERPESTIS**.  
 Stamens 2 perfect, the 2 lower ones reduced to filiform staminodia or entirely deficient.  
 Calyx divided to the base. Capsule 4-valved, leaving the placentas consolidated in a single column . . . . . 12. **GRATIOLA**.  
 Calyx campanulate, 5-lobed. Capsule 2-valved, bearing the separate placentas in their centre . . . . . 13. **DOPATRIUM**.

SUBTRIBE IV. **Vandellieæ**.—*Stem-leaves opposite. Upper stamens perfect and included in the tube. Lower stamens inserted in the throat, either reduced to staminodia or with long arched filaments with an angle or small lobe or appendage near the base, the anthers contiguous or cohering under the under lip. Capsule opening in 2 entire valves parallel to the dissepiment.*

- Perfect stamens 4.  
 Calyx deeply divided into herbaceous segments, dilated and imbricate at the base. Flowers large. Appendage to the lower stamens broad and flat . . . . . 14. **ARTANEMA**.  
 Calyx deeply divided into linear segments, sometimes cohering in a 5-toothed calyx. Appendage to the lower stamens linear . . . . . 15. **VANDELLIA**.  
 Perfect stamens 2. Calyx divided to the base. Staminodia 2, linear and obtuse, entire. Capsule oblong or linear . . . . . 16. **BONNAYA**.

SUBTRIBE V. **Limoselleæ**.—*Small creeping or prostrate herbs with opposite or clustered leaves. Corolla (minute) with a short tube and 5 nearly equal lobes (activation variable?) Anthers 1-celled. Capsule various.*

- Calyx 5-toothed. Stamens 2. Leaves opposite.  
 Capsule loculicidally 2-valved . . . . . 17. **MICROCARPÆA**.  
 Capsule indehiscent or bursting irregularly or obscurely 4-valved . . . . . 18. **PEPLIDIUM**.  
 Calyx obtusely 3 or 4-lobed. Stamens 2 or 4. Capsule loculicidally 2-valved. Leaves opposite . . . . . 19. **GLOSSOSTIGMA**.  
 Calyx 5-toothed. Stamens 4. Leaves clustered or alternate. Capsule opening in 2 valves parallel to the dissepiment . . . . . 20. **LIMOSELLA**.

SERIES C. **Rhinanthideæ**.—*Corolla either with 4, 5 (or rarely more in genera not Australian) spreading lobes, variously imbricate in the bud, the upper ones very rarely outside, or 2-lipped with the upper lip inside. Inflorescence centripetal or very rarely in genera not Australian compound.*

TRIBE V. **Digitaleæ**.—*Corolla-lobes all flat, usually spreading, the lateral, or one of them, exterior in the bud. Anther-cells usually confluent at the tip and spreading below, rarely wholly confluent.—Herbs. Leaves various. Inflorescence simple, centripetal.*

SUBTRIBE I. **Sibthorpieæ**.—*Corolla subrotate; lobes 4 or 5 or more. Stamens as many as lobes, or fewer by 1, equal. Anthers sagittate or horseshoe-shaped.*

- Corolla rotate, 4-lobed. Stamens 4. Anthers equally 2-celled, sagittate . . . . . 21. **SCOFARIA**.

SUBTRIBE II. **Veroniceæ**.—*Corolla rotate or tube campanulate or cylindrical, 4 to 5-lobed. Stamens 2 or 4, exserted, equal. Anthers distant; anther-cells parallel or divergent, tips confluent. Leaves alternate or radical.*

- Corolla rotate or with a distinct tube, 4-lobed. Stamens 2, exserted; anthers with confluent cells, not mucronate . . . . . 22. **VERONICA**.

TRIBE VI **Gerardieæ**.—*Corolla-lobes all flat, spreading, 2 upper usually interior in bud. Anther-cells distinct throughout, bases often mucronate, equal or 1 imperfect or wanting.*

SUBTRIBE I. **Buchnereæ**.—*Calyx tubular or subcampanulate. Corolla-tube slender, limb spreading. Anthers 1-celled, cells narrow; tip usually mucronate.*

- Corolla-tube straight. Capsule obtuse . . . . . 23. **BUCHNERA**.  
 Corolla-tube bent above the middle. Capsule obtuse . . . . . 24. **STRIGA**.  
 Corolla-tube elongated. Capsule acuminate, the beak often oblique . . . . . 25. **RHAMPHICARPA**.

**SUBGEN. II. Eugerardieæ.**—*Calyx* various. *Corolla*-tube short or broad, rarely slender; limb spreading, upper lobes interior in bud. *Anther*-cells equal or 1 smaller and imperfect.

*Corolla* with a distinct tube or broadly campanulate; lobes 5, nearly equal. *Stamens* 4.

*Calyx* herbaceous, split on one side. *Anther*-cells unequal, mucronate or twisted. . . . . 26. CENTRANTHERA.

*Calyx* 5-toothed or shortly 5-lobed. *Anthers* with 1 large scarcely mucronate cell and 1 stipitate empty cell . . . . . 27. SOPHIA.

**TRIBE VII. Euphrasieæ.**—*Corolla* 2-lipped, upper lip erect, concave or hooded, interior in bud, lower usually spreading. *Anther*-cells distinct, bases usually mucronate.

*Corolla*-tube not very slender. *Stamens* 4. *Anther*-cells equal, both mucronate . . . . . 28. EUPHRASIA.

### 1. VERBASCUM, Linn.

(From *Verbascum*: filaments bearded.)

*Calyx* 5-lobed or partite; lobes imbricate. *Corolla* rotate; lobes 5, broad, the upper exterior in bud. *Stamens* 5 (very rarely 4), filaments all or the 3 upper bearded. *Anthers* transverse or oblique, cells confluent. *Style*-top dilated, stigma simple. *Capsule* globose, oblong or ovoid, septicidal; valves separating from the axils. *Seeds* numerous, rugose, not winged. *Embryo* straight.—Erect, tomentose or woolly, usually tall herbs. *Leaves* all alternate. *Flowers* in simple or paniculate, terminal racemes or spikes, ebracteate, yellow, rarely white or red.

*Species* chiefly Mediterranean.

1. **V. Blattaria** (an old generic name of Tournefort's), *Linn.: Benth. in DC. Prod.* x. 230. Moth Mullein. An erect coarse simple or scarcely branched biennial of 2 to 3 ft., either glabrous or slightly glandular-pubescent in the upper part. *Leaves* alternate, oblong, coarsely toothed or sinuate, the lower ones petiolate, the upper ones sessile and sometimes slightly decurrent. *Flowers* yellow or rarely white, in a long loose simple raceme on pedicels of 3 to 6 lines. *Calyx* deeply 5-cleft. *Corolla* rotate, with 5 broad rounded lobes. *Stamens* 5 declinate, the filaments woolly with purple hairs. *Anthers* 1-celled. *Capsule* 2-valved with numerous small seeds.—*Blattaria vulgaris*, Fourr.

*Habit*: Europe. Met with as a stray from garden culture in southern localities.

### 2. CELSIA, Linn.

After Olaus Celseus, M.D.)

*Characters* of *Verbascum*, but *stamens* 4.

1. **C. cretica** (Cretan), *Linn.: Benth. in DC. Prod.* x. 244. An erect biennial with much the habit of *Verbascum Blattaria*, pubescent and more or less viscid. Lower and radical leaves lyrate-pinnatifid, upper ones cordate and stem-clasping. *Flowers* larger than in *V. Blattaria*, sessile within each bract, in a long terminal spike. *Calyx* divided into 5 broad serrate segments. *Corolla* rotate. *Stamens* 4, declinate, the 2 upper ones with woolly filaments and short reniform anthers, the 2 lower with much longer glabrous filaments and linear adnate anthers. *Capsule* 2-valved.

*Habit*: Europe. Met with in southern localities as a stray from garden culture.

### 3. CALCEOLARIA, Linn.

(Fanciful resemblance of the corolla to a slipper, *calceolus*.)

*Calyx* 4-parted; segments valvate, nearly equal, the upper segment generally a little broader than the rest. *Corolla* with a very short tube; limb 2-lipped, the upper short, truncate-ly rounded, entire, the lower often large and inflated,

concave, slipper-shaped. Stamens 2, inserted at the base of the tube; short cells of anthers divaricate (one of which is sterile). Stigma minute. Capsule ovate-conical, 2-celled, opening septically, valves bifid; placentas adnate to the dissepiment. Seeds numerous, sulcately angular.—Herbs, undershrubs, or shrubs, with opposite verticillate very rarely alternate leaves. Flowers in many-flowered cymes, rarely solitary; yellow, white, or purplish.

1. **C. scabiosæfolia** (Scabiosa-leaved), *Hook. and Schultz., Bot. Mag. t.* 2405. An annual pubescent plant from a few inches to over a foot high. Leaves opposite, pinnate or pinnatifid; pinnae or lobes acuminate, serrate. Flowers in the upper axils, the peduncles lengthening out after flowering, bright-yellow. Calyx 4-parted. Corolla 2-lipped, the upper very short, concave-hooded, the lower large and inflated, nearly orbicular, flattened. Stamens 2, filaments with 2 arms, one arm bearing a 1-celled anther concealed under the hood of the upper lip of flower, the other sterile arm exerted. Ovary pubescent, 2-celled. Style conical. Stigma simple, seeds numerous.—*C. pinnata*, R. & P.

Hab.: Peruvian annual. Naturalised on the banks of the Brisbane River.

#### 4. \***LINARIA**, Juss.

(*Linum*-like.)

Sepals 5, imbricate. Corolla-tube spurred in front, upper lip erect, 2-lobed; lower spreading, 3-lobed, throat usually closed by the tumid palate. Stamens 4, didynamous, ascending, included; anther-cells distinct, parallel. Style filiform, stigma minute. Capsule ovoid or globose, 2-celled. Each cell or the anterior only opening by an apical pore. Seeds numerous, polymorphous.—Herbs. Leaves usually opposite, or whorled below and alternate above. Flowers axillary, racemose or spicate, ebracteate.

Almost all the species belong to the temperate regions of the Old World.

1. **L. bipartita** (2-parted). An erect annual. Leaves linear or linear-lanceolate, flat, alternate or verticillate, those of the surculi broader and 3 or 1 in a whorl. Flowers in a terminal raceme; segments of calyx lanceolate, with membranous margins. Corolla usually violet-purple, the palate orange, spur arched long as corolla. Capsule opening by 6 teeth at the apex. Seeds oblong, black, slightly curved.—*Antirrhinum bipartitum*, Vent.

Hab.: Met with us a stray from garden culture.

#### 5. **MIMULUS**, Linn.

(A little mask; appearance of capsule.)

(*Uvedalia*, R. Br.)

Calyx tubular, with 5 prominent angles, ending in 5 small teeth. Corolla tubular at the base, the upper lip erect or spreading, 2-lobed; the lower lip spreading, 3-lobed, usually with 2 protuberances at its base in the throat; all the lobes broad and rounded. Stamens 4 in pairs; anthers all perfect, 2-celled, but the cells often confluent at the top. Style with 2 ovate nearly equal stigmatic laminae. Capsule scarcely furrowed, opening loculicidally in 2 valves which sometimes split along the dissepiment, leaving an entire or bifid central column bearing the placentas. Seeds small, numerous.—Erect or prostrate herbs. Leaves opposite. Flowers solitary on axillary pedicels, without bracteoles, the upper ones forming sometimes a terminal raceme.

The genus is widely dispersed over the temperate regions of N. and S. America, as well as along the range of the Andes, more sparingly in Eastern Asia, the mountains of tropical Asia and in S. Africa. Of the 4 Australian species, 1 is closely allied to, if not identical with, a common one in Asia and Africa, another extends to New Zealand, the remaining 2 are endemic.—*Benth.*

Stems ascending or erect, not much branched except at the base. Plant glabrous.

Annual (?), very slender and weak, with small linear-lanceolate distant leaves . . . . . 1. *M. Uvedaliae*.

Perennial. Leaves oblong or lanceolate, obtuse . . . . . 2. *M. gracilis*.

Stems prostrate or creeping, much branched.

Plant glabrous. Leaves rather thick, ovate or oblong . . . . . 3. *M. repens*.

Plant more or less pubescent. Leaves very small, narrow-oblong.

Corolla-tube long . . . . . 4. *M. prostratus*.

1. ***M. Uvedaliae*** (old generic name), *Benth. in DC. Prod.* x. 369, and *Fl. Austr.* iv. 482. Apparently annual and quite glabrous, the stems very slender and weak, slightly branched, under 1ft. long. Radical leaves rosulate, ovate, but very soon disappearing; stem-leaves small and distant, linear-lanceolate, acute or scarcely obtuse, entire, stem-clasping, rarely exceeding  $\frac{1}{2}$ in. Pedicels in the upper axils slender, 1 to 2in. long or more. Calyx 2 to  $2\frac{1}{2}$  lines long, the teeth very small. Corolla about twice as long as the calyx, pale-blue with a yellow throat (*Soland. MSS.*). Capsule oblong, shorter than the calyx, the valves readily splitting.—*Uvedalia linearis*, R. Br. *Prod.* 440.

Hab.: Endeavour River, *Banks and Solander*; A. *Cunningham*; Broadsound and Shoalwater Bay, *R. Brown*.

2. ***M. gracilis*** (slender), *R. Br. Prod.* 439; *Benth. Fl. Austr.* iv. 482. Quite glabrous. Stems from a perennial somewhat creeping rhizome, erect, usually about 6in. and rarely in the Australian specimens nearly 1ft. high, not much branched except at the base. Leaves linear-oblong to oblong-lanceolate, obtuse, entire, in some specimens attaining 1in., but in others all under  $\frac{1}{2}$ in. long. Pedicels sometimes scarcely longer than the leaves, but often attaining 1 to 2in. Calyx about  $2\frac{1}{2}$  lines long, with short acute teeth. Corolla violet purple or blue, the tube shortly exceeding the calyx or rarely half as long again, the lobes very broad, those of the lower lip retuse, all minutely ciliate. Capsule enclosed in the calyx, oblong, the valves readily splitting.—*Benth. in DC. Prod.* x. 369. *M. pusillus*, *Benth. l.c.*

Hab.: Broadsound, *R. Brown*; Dawson River, *F. v. Mueller*; Rockhampton, *O'Shanesey*; Curriwillinghi, *Barton*; Warwick, *Beckler*; Stanthorpe and many other localities both north and south.

The species is also widely spread over hilly regions in Asia and Africa, but there represented chiefly by a luxuriant variety larger in all its parts, which I had originally published under the name of *M. strictus*, and from which the description of *M. gracilis* in the "Prodromus" is chiefly taken. The common form in Australia is the smaller one which I had considered as a distinct species under the name of *M. pusillus*, but some of the luxuriant Queensland specimens come very near to the Asiatic ones.—*Benth.*

3. ***M. repens*** (creeping), *R. Br. Prod.* 439; *Benth. Fl. Austr.* iv. 482. A small glabrous prostrate perennial, creeping and rooting at the joints. Leaves sessile or scarcely petiolate, sometimes stem-clasping, from broadly ovate to oblong, obtuse, rather thick, often all under 2 lines long and rarely exceeding 3 lines. Flowers few, the pedicel often shorter than the leaves at the time of flowering, but lengthening considerably afterwards. Calyx scarcely 2 lines long, truncate, with small distant teeth. Corolla blue often yellow in the centre, the tube not 3 lines long, dilated upwards, the lobes all broad and as long as the tube, the upper ones not much shorter than the lower. Capsule nearly globular, about 2 lines diameter, the valves readily splitting.—*Benth. in DC. Prod.* x. 373; *Hook. f. Fl. Tasm.* i. 290; *Bot. Mag.* t. 5423.

Hab.: Southern localities inland.

The species is also in New Zealand. The habit and foliage is often that of smaller specimens of *Herposiphon Monnieria*, but the calyx and corolla are very different.—*Benth.*

4. ***M. prostratus*** (prostrate), *Benth. in DC. Prod.* x. 373, and *Fl. Austr.* iv. 483. A small diffuse or prostrate much-branched perennial, more slender than *M. repens*, and not so frequently rooting at the joints, the whole plant rarely



exceeding 2 or 3 in., the branches and peduncles and often the foliage also pubescent and sometimes slightly glandular. Leaves sessile, narrow-oblong, obtuse, entire, 1 to 2 or rarely 3 lines long, resembling those rather of *M. gracilis* than of *M. repens*. Pedicels filiform, usually longer than the leaves, and sometimes  $\frac{3}{4}$  to 1 in. long. Calyx scarcely 2 to 4 lines long, with short acute teeth. Corolla-tube at least twice as long as the calyx, and more slender than in the other Australian species, yellow, limb violet. Capsule oblong, shorter than the calyx, the valves usually entire.

Hab.: Norman and Gilbert Rivers, *T. Gulliver*: southern localities inland.

## 6. MAZUS, Lour.

(From *māzos*, a breast: from the swellings on throat of corolla.)

Calyx broadly campanulate, 5-lobed. Corolla with the upper lip erect, ovate shortly bifid; the lower lip much larger, spreading, broadly 3-lobed, with 2 slight protuberances at its base in the throat. Stamens 4, all fertile; anther-cells contiguous, at length divaricate. Style with 2 ovate equal stigmatic laminae. Capsule globular or compressed, obtuse, opening loculicidally in 2 entire valves. —Low herbs. Lower leaves opposite, the upper ones alternate, or all nearly rosulate. Flowers in terminal one-sided racemes or solitary.

The genus comprises a small number of tropical and east Asiatic species, besides the Australian one, which only extends to New Zealand. — *Benth.*

1. ***M. pumilio*** (small). *R. Br. Prod.* 439; *Benth. Fl. Austr.* iv. 484. A small perennial, with a creeping rhizome. Stems very short or scarcely any besides the peduncle. Leaves forming an erect tuft or spreading rosette, from obovate and not  $\frac{1}{2}$  in. long to oblong and above 2 in. long, all obtuse, irregularly sinuate-toothed or rarely entire, glabrous or nearly so underneath, rarely glabrous on both sides. Scapes or peduncles leafless, usually exceeding the leaves, bearing either a single flower or a loose raceme of very few flowers on long pedicels. Bracts very few and minute, scattered more frequently on the pedicels than on the peduncle, and often entirely wanting. Calyx about 2 lines long, the lobes narrow, shorter than the tube, enlarged and more deeply lobed after flowering. Corolla-tube scarcely exceeding the calyx; lobes of the lower lip longer than the tube. Capsule enclosed in the calyx. — *Benth.* in *DC. Prod.* x. 375; *Hook. f. Fl. Tasm.* i. 290; *Endl. Iconogr.* t. 102; *Hook. le. Pl.* t. 567 (the flowers too small).

Hab.: Maroochie.

The species is also in New Zealand, and comes near to some of the smaller forms of the common Asiatic *M. rugosus*, but besides the difference in habit and foliage, the calyx is narrow and much less open. — *Benth.*

## 7. ADENOSMA, R. Br.

(Glandular hairs scented.)

(*Pterostigma*. *Benth.*)

Calyx divided to the base into 5 segments or sepals, the upper one larger. Corolla tubular at the base, the upper lip erect, entire or notched, the lower one spreading, 3-lobed. Stamens 4, in pairs; anthers of the lower pair 1-celled (by the abortion of the other cell), of the upper pair 2-celled, with the cells separate and rather distant, or rarely 1-celled. Style dilated at the end into 2 short stigmatic lobes, and more or less winged below the lobes. Capsule acuminate, opening septically in 2 bifid valves or in 4 valves, the placentas of the 2 carpels completely separating at maturity. Seeds numerous, small, striate and reticulate. — Glandular-pubescent or villous herbs, usually strong-scented and

turning black in drying. Leaves opposite. Flowers solitary in the upper axils, the upper ones often forming terminal spikes or heads. Bracteoles 2, linear, close under the calyx.

The genus consists of a very few tropical Asiatic plants. The Queensland species has a wide range in the Archipelago and some parts of India.

1. **A. cæruleum** (blue). *R. Br. Prod.* 443; *Benth. Fl. Austr.* iv. 484. An erect, simple or branched, rather coarse annual, from under 1ft. to nearly 2ft. high, glandular-pubescent or villous all over, strongly scented. Leaves shortly petiolate ovate and scarcely exceeding 1in. in the typical form, ovate-lanceolate and above 2in. long in some Asiatic specimens, the floral ones gradually smaller and passing into sessile bracts not exceeding the calyxes. Flowers blue, very shortly pedicellate, the lower ones axillary and distant, the upper ones forming a more or less compact terminal raceme. Bracteoles shorter than the calyx. Calyx very villous, oblique and slightly curved, 3 to 4 lines long, the upper segment lanceolate, the lower ones linear. Corolla 5 to 6 lines long, the lips nearly equal, shorter than the tube. Lower stamens nearly as long as the corolla, with 1-celled anthers; upper ones shorter, the anthers with 2 cells separated by a broad thick connectivum. Capsule acuminate, rather hard, somewhat incurved, about as long as the calyx.—*Pterostigma villosum*, Benth. *Scroph. Ind.*, and in DC. *Prod.* x. 383; *P. strictum*, Griff. *Notul.* iv. 96, and *lc. Pl. Asiat.* t. 417, fig. 3.

Hab: Endeavour Bay, *Banks and Solander*, to Cape York.  
Also met with in Java, Borneo, and India.

### 8. STEMODIA, Linn.

(*Stemon*, a stamen, and *dis*, double; alluding to the anthers, which consist of two separate ones.)

Calyx divided to the base into 5 segments or sepals, all equal or the upper ones scarcely larger. Corolla tubular at the base, the upper lip broad, entire or notched, the lower one spreading, 3-lobed. Stamens 4, in pairs; anthers 2-celled with the cells quite separate, usually stipitate. Style dilated at the summit into 2 stigmatic lobes or rarely entire, not winged. Capsule globular, ovate or acuminate, opening septicidally in 2 usually 2-fid valves or in 4 valves, the placentas of the 2 carpels completely separating at maturity (at least in the Australian section). Seeds numerous, small, striate and usually reticulate.—Herbs, rarely undershrubs, more or less glandular-pubescent or villous and often strong-scented. Leaves opposite or in whorls of 3 or 4. Flowers solitary in the axils, the upper ones often forming terminal spikes. Bracteoles usually 2, linear, close under the calyx.

The genus is chiefly from tropical and southern extratropical America, represented by 2 species in tropical Asia and Africa, one of which being the Queensland species.

Leaves mostly lanceolate or oblong, sessile and stem-clasping or a few of the lowest rarely petiolate. Stems erect or ascending.

Flowers sessile or very shortly pedicellate. Corolla (about 3 lines long)

shortly exceeding the calyx . . . . . 1. *S. lythrifolia*.  
Flowers on pedicels longer than the calyx . . . . . 2. *S. viscosa*.

1. **S. lythrifolia** (leaves *Lythrum*-like). *F. v. M. in Herb. Hook.*; *Benth. Fl. Austr.* iv. 486. A hard erect slightly-branched herb attaining 1 to 2ft., very softly villous all over, almost woolly, and sometimes slightly viscid. Leaves ovate-lanceolate, oblong or lanceolate, serrate or almost entire, narrowed below the middle but usually dilated and stem-clasping at the base, soft and rugose, the larger ones 1 to 2in. long, the lowest sometimes more distinctly petiolate, the floral ones small and ovate passing into entire bracts. Flowers small, sessile in the upper axils, the uppermost forming a compact spike with the ovate bracts

almost imbricate in 4 rows and scarcely exceeding the calyxes. Calyx glandular-pubescent, about 2 lines long, the segments narrow-lanceolate, acute, rather unequal. Corolla shortly exceeding the calyx, the upper lip broad, truncate or slightly notched. Anthers all 2-celled. Capsule hard, acuminate, not exceeding the calyx.—*Stemodia varileva*, Benth. in DC. Prod. x. 381, as to A. Cunningham's plant but not R. Brown's synonymy.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown* (not inserted in Brown's Prodrömus).

2. **S. viscosa** (sticky), *Roeb. Fl. Corom.* ii. 33, t. 163; *Benth. Fl. Austr.* iv. 486. A perennial with ascending or erect not much-branched stems from under 6 in. to above 1 ft. high, the whole plant pubescent or villous, viscid and scented. Leaves opposite or in whorls of three, the lower ones often ovate and contracted into a petiole, the upper ones or nearly all lanceolate, acute, serrate, often dilated and stem-clasping at the base, the larger ones 1 to 2 in. long but often all under 1 in., the upper floral ones gradually smaller but usually distant. Flowers axillary, on pedicels always longer than the calyx and sometimes exceeding the leaves. Calyx usually about 2 lines long, the segments narrow, nearly equal or one larger. Corolla at least twice as long as the calyx, the upper lip very broad, entire or slightly notched, the lower with 3 ovate very obtuse lobes. Anthers all 2-celled. Capsule acuminate, as long as the calyx.—*Benth.* in DC. Prod. x. 381; *Wight Ic.* t. 1408.

Hab.: Gulf of Carpentaria *Landsborough*.

The species is common in East India.

## 9. MORGANIA, R. Br.

(After Hugh Morgan.)

Calyx divided to the base into 5 narrow segments, all equal or nearly so. Corolla tubular at the base, the upper lip broad, entire or shortly 2-lobed, the lower one spreading, 3-lobed. Stamens 4, in pairs; anthers 2-celled, with the cells quite separate and somewhat stipitate. Style deflected at the summit, with 2 short spatulate stigmatic lobes, scarcely winged at the bend. Capsule ovoid oblong or shortly acuminate, opening septically in 2 2-fid or in 4 valves, leaving the placentas united in a single column in the centre. Seeds numerous, small, striate.—Herbs either glabrous or slightly pubescent. Leaves opposite or rarely in whorls of 3, narrow. Flowers solitary in the axils, sessile or pedicellate, with small linear bracts close under the calyx.

The genus is limited to Australia.

Flowers sessile or the pedicels rarely as long as the calyx. Corolla-lips as long as the tube, the upper one entire.

Plant glabrous or nearly so . . . . . 1. *M. floribunda*.

Plant hoary-pubescent . . . . . 2. *M. pubescens*.

Pedicels mostly longer than the calyx. Flowers rather large, the lips shorter than the tube, the upper one entire . . . . . 3. *M. glabra*.

1. **M. floribunda** (flowers abundant), *Benth.* in *Mitch. Trop. Austr.* 384, and *Fl. Austr.* iv. 488. Stems from a perennial stock erect, usually taller less branched and more rigid than in *M. glabra*, glabrous or nearly so and often glaucous. Leaves linear or linear-lanceolate, entire or with few teeth, from about  $\frac{1}{2}$  in. to above 1 in. long. Flowers blue, fragrant, almost sessile or on pedicels usually very short or rarely as long as the calyx, often appearing clustered with small leaves in the axils owing to the partial development of axillary branchlets. Calyx rather larger than in *M. glabra* and corolla the same size, but much more deeply cleft, the tube scarcely exceeding the calyx and the lips as long as the tube, the upper one broad truncate and entire as in *M. glabra*. Filaments white, anthers at first black. Capsule shortly acuminate.

Hab.: Rockhampton and Keppel Bay, *Thozet*; Crocodile Creek, *Boorman*; Balonne and Narran Rivers, *Mitchell*. A common inland plant.

2. ***M. pubescens*** (downy), *R. Br. Prod.* 441; *Benth. Fl. Austr.* iv. 488. Very nearly allied to *M. floribunda*, and, as far as could be ascertained in the few specimens seen, with the same nearly sessile flowers calyx and corolla, but the whole plant hoary with a short soft pubescence.—*Benth.* in *DC. Prod.* x. 385; *Endl. Iconogr.* t. 103.

Hab.: Comet River, *Leichhardt*; Broadsound, *R. Brown*.

3. ***M. glabra*** (without hairs), *R. Br. Prod.* 441; *Benth. Fl. Austr.* iv. 488. Stems from a perennial stock erect, usually branched, rather slender,  $\frac{1}{2}$  to 1 ft. high, glabrous or with a minute almost granular pubescence on the upper parts and flowers. Leaves sessile, linear or linear-lanceolate, entire or with very few small teeth,  $\frac{1}{2}$  to 1 in. long. Flowers in the upper axils, on slender pedicels, sometimes short at first but at length much longer than the calyx. Calyx not 2 lines long, deeply divided into narrow segments. Corolla above  $\frac{1}{2}$  in. long, the tube twice as long as the calyx, the lips broad, the upper one truncate, the lower 3-lobed, both much shorter than the tube. Capsule shortly acuminate.—*Benth.* in *DC. Prod.* x. 385.

Hab.: Gulf of Carpentaria, *Landsborough*; Broadsound, *R. Brown*; estuary of the Burdekin, *F. v. Mueller*; Fitzroy River, *Bowman*; Barcoo River, *Mitchell*; Curriwillingham, *Barton*.

## 10. LIMNOPHILA, *R. Br.*

(Found in wet places.)

Calyx divided to the base or below the middle into 5 narrow segments, all equal or nearly so. Corolla tubular at the base, the upper lip broad, entire, notched or shortly 2-lobed, the lower one spreading, 3-lobed. Stamens 4, in pairs; anthers 2-celled, with the cells quite separate and somewhat stipitate. Style deflected at the summit, with 2 short flat stigmatic lobes, scarcely winged at the bend. Capsule broadly ovoid or oblong, usually obtuse, opening in 4 valves, leaving the dissepiment entire at least at the base, bearing the placentas on its faces, thus forming as it were two wings to the undivided placental column. Seeds numerous, small, striate and transversely reticulate.—Herbs usually growing in marshes or shallow water, glabrous or slightly pubescent, usually scented and marked with pellucid dots. Leaves opposite or whorled, toothed or deeply cut, the submerged ones in some species divided into numerous capillary segments. Flowers solitary in the axils, the upper ones sometimes forming a terminal raceme. Bracteoles linear, close under the calyx.

A considerable genus, chiefly tropical, and limited to the Old World.

Lower leaves (or all) deeply divided. Flowers pedicellate. Calyx-segments

1-nerved.

Leaves all undivided. Flowers pedicellate. Calyx-segments several-nerved,

striate. Glabrous

1. *L. gratioloides*

2. *L. punctata*.

1. ***L. gratioloides*** (*Gratiola*-like), *R. Br. Prod.* 442; *Benth. Fl. Austr.* iv. 489. Stems from a creeping base, ascending or erect, usually about 6 in. high, but sometimes very short decumbent and branched, or drawn up into simple stems of 1 to 2 ft., the whole plant glabrous. Leaves mostly opposite, but the lower ones usually divided to the base into narrow toothed or pinnatifid segments so as to appear whorled, and when under water cut up into numerous capillary segments or lobes; the upper ones sometimes, or very rarely nearly all, undivided, sessile, linear or lanceolate and slightly toothed, all under 1 in. long and usually about  $\frac{1}{2}$  in. Pedicels in the upper axils longer than the calyx and usually exceeding the leaves. Bracteoles small. Calyx usually under 2 lines long at the time of flowering, the segments lanceolate, acuminate, broad at the base especially after flowering, membranous and 1-nerved. Corolla blue, with the centre yellow

inside, about 5 or 6 lines long, the tube exceeding the calyx, the lips broad and shorter than the tube, the upper one shortly 2-lobed. Anthers cohering in pairs. Capsule broad and obtuse.—Benth. in DC. Prod. x. 389, with the synonyms quoted (except the reference to Gaudichaud's plate in Freyc. Voy. t. 57. f.l., which is evidently *L. sessiliflora*); F. v. M. Fragm. vi. 104; Rheede, Hort. Mal. ix. t. 85.

Hab.: Gulf of Carpentaria, *F. v. Mueller*; Broadsound, *R. Brown*, *Boorman*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*.

The species is widely dispersed over tropical Asia and Africa. The flowers are variously described by Australian collectors as yellow pink or red.—*Benth.*

2. ***L. punctata*** (spotted), *Blume*; *Benth. in DC. Prod.* x. 388, and *Fl. Austr.* iv. 490. Stems ascending or erect, usually taller and stouter than in *L. gratioloides*, often above 1ft. high, the whole plant glabrous. Leaves opposite or rarely in whorls of 3, sessile and stem-clasping, oblong-lanceolate, minutely serrate, 1 to 1½ or even 2in. long, the upper ones smaller, the larger ones sometimes rugose. Flowers violet-blue, 7 to 8 lines long, on pedicels scarcely shorter than the floral leaves, the upper ones sometimes forming a very loose leafy raceme. Calyx-segments lanceolate, subulate-acuminate, often above 3 lines long, striate with 5 to 7 prominent nerves. Corolla-lips shorter than the tube, the upper one very broad and retuse but scarcely lobed. Anthers cohering in pairs. Capsule oblong, shorter than the calyx.

Hab.: Wide Bay, *Bidcell*; Rockingham Bay, *Dallachy*; not uncommon in the swamps north and south.

Common in the Indian Archipelago, also in Ceylon.

## 11. HERPESTIS, Gærtn. f.

(Alluding to creeping habit of plant.)

Calyx divided to the base into 5 distinct sepals, the outer one much broader than the others. Corolla tubular at the base, the upper lip erect or spreading, notched or 2-lobed, the lower lip spreading, 3-lobed, or sometimes the 5 lobes nearly equal. Stamens 4, in pairs, the anthers all perfect, 2-celled, the cells contiguous. Style dilated at the summit, concave or slightly 2-lobed. Capsule opening loculicidally in 2 often bifid valves or in 4 valves, leaving the placental on a free central column or dissepiment. Seeds numerous, usually striate and transversely reticulate.—Glabrous or rarely pubescent herbs. Leaves opposite, entire, toothed or in some non-Australian aquatic species the submerged ones cut into numerous capillary segments. Flowers axillary, or, in species not Australian, in a terminal raceme. Bracteoles under the calyx only in a very few species.

A considerable tropical and subtropical genus, chiefly American, with a few species natives of the Old World. Of the 2 Australian species, one is common over nearly the whole area of the genus, the other extends over tropical Asia and Africa.

Erect. Leaves narrow. Flowers numerous, on short pedicels . . . . . 1. *H. floribunda*.  
Procumbent or creeping. Leaves small, obovate or oblong, rather thick.

Flowers few, on long pedicels . . . . . 2. *H. Monnierii*.

1. ***H. floribunda*** (flowers abundant), *R. Br. Prod.* 442; *Benth. Fl. Austr.* iv. 491. Apparently annual, erect and branching, rarely above 1ft. high, quite glabrous. Leaves lanceolate or linear-lanceolate, rather obtuse, entire, narrowed to the base, 1-nerved, rarely above 1in. long. Pedicels slender but usually shorter than the petiole, often 3 together in each axil owing to the partial development of an axillary branchlet. Bracteoles very small, a little below the calyx. Calyx scarcely above 1½ line long at the time of flowering, 2 to 3 lines when in fruit, the segments thin, at first herbaceous, at length membranous and

reticulate, the outer one broadly ovate, the 2 next narrow-ovate, the 2 innermost almost linear. Corolla scarcely exceeding the calyx. Capsule ovoid-globular, shorter than the calyx, opening in 4 valves.—Benth. in DC. Prod. x. 400.

Hab.: Shoalwater Bay, *E. Brown*: Burdekin River, *Bourman*: Rockhampton, *P. O'Shanesey*. The species extends over tropical Asia and Africa.

2. **H. Monnieria** (after William Le Monnier), *H. B. and K.*; Benth. in DC. Prod. x. 400, and *Fl. Austr.* iv. 491. A low creeping or procumbent glabrous leafy annual (or perennial?). Leaves obovate or oblong, rarely above  $\frac{1}{2}$  in. long, rather thick, entire or erenate, without prominent veins or obscurely 1 or 3-nerved. Flowers few, pale blue or almost white, on pedicels usually rather longer than the leaves, with 2 small bracteoles under the calyx. Calyx about 2 lines long or 3 lines when in fruit, the outer sepal oval, the others ovate-lanceolate or lanceolate. Corolla-tube scarcely so long as the calyx, the 5 lobes spreading, broad, as long as the tube, the 2 upper ones rather smaller and less deeply separated than the others. Capsule ovoid, shorter than the calyx, opening loculicidally in 2 valves, which at length separate from the dissepiment and sometimes split into 2. Bot. Mag. t. 2557; Rheede, Hort. Mal. x. t. 14.

Hab.: Moreton Island, *McGillivray*: Burnett River, *F. v. Mueller*: Nerkool Creek, *Bourman* very common in the swamps of the southern parts of the colony. In flower, October.

The species is one of the commonest marsh plants in the tropical and subtropical regions of both the New and the Old World, and has been described under a great variety of names, as detailed in the above-quoted "Prodromus."—Benth.

## 12. GRATIOLA, Linn.

(From *gratia*, grace; medicinal properties of one species.)

Calyx divided to the base into 5 nearly equal segments or sepals. Corolla tubular at the base, the upper lip broad and entire or shortly 2-lobed, the lower 3-lobed. Stamens 2 perfect, with the anthers connivent, the cells parallel and distinct but contiguous; the lower stamens reduced to slender staminodia or entirely wanting. Style dilated and deflected at the summit, entire or with 2 flat lobes. Capsule 4-valved, leaving a single columnar placenta bordered by a portion of the dissepiment. Seeds small, striate and transversely reticulate.—Erect or procumbent herbs, glabrous or glandular-pubescent. Leaves opposite, undivided. Flowers axillary, sessile or pedicellate, with a pair of bracteoles close under the calyx.

The species are not numerous, dispersed over the temperate and subtropical regions of both hemispheres.

Flowers pedunculate. Stems erect. Leaves lanceolate. Staminodia none 1. *G. pedunculata*.  
Flowers sessile. Stems erect. Leaves ovate or lanceolate. Staminodia  
filiform, often exceedingly slender. . . . . 2. *G. peruviana*.

1. **G. pedunculata** (pedunculate), *H. Br. Prod.* 435; Benth. *Fl. Austr.* iv. 492. Stems from a shortly decumbent or sometimes creeping base, erect or ascending, scarcely branched,  $\frac{1}{2}$  to 1 ft. high, the whole plant minutely viscid-pubescent or rarely glabrous. Leaves lanceolate or oblong, bordered by a few teeth or nearly entire, the lower ones often contracted at the base but mostly stem-clasping, the larger ones sometimes above 1 in. long, but generally smaller. Pedicels shorter or sometimes longer than the leaves, rarely shorter than the calyx. Bracteoles linear, sometimes as long as the calyx. Calyx-segments linear-lanceolate, acute, rather unequal, 2 to  $2\frac{1}{2}$  lines long. Corolla white, yellowish inside, at least twice as long as the calyx, the lips short and broad, the upper one very shortly 2-lobed. Anthers of the perfect stamens cohering, the cells parallel and transverse, the lower stamens entirely wanting. Capsule ovoid-globular, rather obtuse, often slightly exceeding the calyx.—Benth. in DC. Prod. x. 403.

Hab.: A very common plant both in the southern and northern swamps.

**2. *G. peruviana*** (of Peru), *Linna.: Benth. in DC. Prod.* x. 403, and *Fl. Austr.* iv. 493. Stems from a procumbent or creeping base, often rooting at the lower nodes, ascending or erect, 6in. to 1ft. high, the whole plant quite glabrous or viscid-pubescent. Leaves sessile and stem-clasping, from ovate to lanceolate, obtuse or acute, serrate or almost entire, usually 3-nerved, especially when broad,  $\frac{1}{2}$  to 1in. long. Flowers sessile or nearly so in the upper axils, larger than in *G. pedunculata*. Calyx 2 to 3 lines long or even longer when in fruit, the segments linear-lanceolate, acuminate. Corolla 6 to 7 lines long, the lips broad, much shorter than the tube, the upper one notched. Anthers connivent, almost cohering, with transverse parallel cells. Staminodia filiform, with minute globular heads, sometimes short and so slender as to be very difficult to find, sometimes more elongated. Capsule ovoid-globular, rather obtuse, membranous.—*G. pubescens*, R. Br. *Prod.* 435: *Benth. in DC. Prod.* x. 404: *Bartl. in Pl. Preiss.* i. 342 (the narrow-leaved pubescent form): *G. latifolia*, R. Br. l.c.; *Benth. l.c.* 403: *Hook. f. Fl. Tasm.* i. 291 (the broad-leaved glabrous form); *G. glabra*, Walp. *Rep.* iii. 287 (given by mistake as a name of Brown's).

Hab.: Moreton Bay, *Fitzalan* (with rather broad glabrous leaves); other southern localities.

The species is also in New Zealand and in extratropical S. America, where it is usually narrow-leaved and nearly glabrous, as represented by J. A. Schmidt in *Mart. Fl. Bras. Scroph.* t. 49, but occasionally very viscid-pubescent, and more rarely broad-leaved. *Benth.*

### 13. DOPATRIUM, Hamilt.

(Derivation doubtful.)

Calyx campanulate, 5-lobed. Corolla tubular at the base, with the lips spreading, the upper one 2-lobed, the lower larger and 3-lobed. Stamens, 2 upper ones perfect, included in the tube; anther-cells distinct and parallel, 2 lower reduced to minute filiform staminodia. Style with 2 flat stigmatic lobes. Capsule opening loculicidally in 2 entire or rarely bifid valves, bearing in their centre the separate placentas.—Slender glabrous herbs. Leaves opposite, chiefly at the base of the stem, the others usually minute and few. Pedicels filiform. Bracteoles none.

A genus with very few species, inhabitants of marshy or rich moist places in tropical Asia and Africa. The only Australian species is a common one in India.

The ovary and capsule of this genus differ from those of all other *Gratiolæ* in being scarcely perfectly 2-celled. The broad flat placentas are at right angles to the dissepiment, and although their inner faces are contiguous and bear no ovules or seeds, yet they do not cohere, the ovules and seeds being very numerous on their backs or outer faces, turned towards the walls of the cavity.—*Benth.*

**1. *D. junceum*** (Rush-like), *Hamilt.: Benth. in DC. Prod.* x. 407, and *Fl. Austr.* iv. 491. A glabrous erect annual, branching chiefly at the base, sometimes scarcely above 2 or 3in. high, but when luxuriant its slender stems attain 1ft. Lower and radical leaves oblong, obtuse, entire, contracted at the base and often above  $\frac{1}{2}$ in. long, the others small, sessile, ovate, the upper ones few and distant and scarcely 1 line long. Flowers in the upper axils usually short but sometimes nearly  $\frac{1}{2}$ in. long. Calyx scarcely  $\frac{3}{4}$  line long, divided to about the middle into narrow obtuse lobes. Corolla-tube about  $1\frac{1}{2}$  line long, the throat very open, the upper lip 2 lobed, the lower very broadly 3-lobed, as long as the tube. Capsule globular, scarcely 1 line diameter.—*Griff. Notul.* iv. 102, and *l.c. Pl. Asiat.* t. 418, fig. 6; *Gratiola juncea*, Roxb. *Pl. Corom.* ii. t. 129.

Hab.: Rockhampton, *O'Shanesey*.

Common in E. India.

### 14. ARTANEMA, Don.

(Referring to the tooth, or support of the filament.)

Calyx deeply divided into 5 herbaceous acuminate segments, dilated and much imbricate at the base. Corolla with a long broad tube, the upper lip broad and notched, the lower 3-lobed. Perfect stamens 4, the anthers cohering

in pairs with divaricate cells, the upper stamens included in the tube; filaments of the lower ones adnate almost to the throat, long and arched, with a broad appendage near the base. Style with 2 flat stigmatic lobes. Capsule globular, opening in 2 thin valves parallel to the broad thin dissepiment.—Erect herbs. Leaves opposite. Flowers large, pedicellate in the axils of small bract-like floral leaves, without bracteoles.

The genus consists of only 3 closely allied species, 1 of them Australian, the other 2 from tropical Asia. It only differs from *Vandellia* in the larger flowers, broader calyx-segments, and in the shape of the staminal appendage. *Benth.*

1. ***A. fimbriatum*** (fringed), *Don. in Sweet Brit. Fl. Gard. ser. 2, t. 234; Benth. Fl. Austr. iv. 495.* An erect rather coarse annual (or sometimes perennial) of 1 to 2ft., the angles of the stems and upper surface of the leaves scabrous, otherwise glabrous. Lower leaves petiolate and ovate-lanceolate, upper ones more sessile and lanceolate, sometimes very narrow, the larger ones 2 to 4in. long, all more or less serrate or rarely entire. Flowers violet, in distant pairs, forming very loose terminal racemes, the floral leaves reduced to small bracts. Pedicels  $\frac{1}{2}$  to 1in. long. Calyx-segments 3 to 4 lines long, the points usually recurved. Corolla above 1in. long; lobes broad and rounded, minutely and irregularly crenulate or jagged. Appendage of the lower filaments broad, rounded, and scale-like. Capsule 3 to 4 lines diameter.—*Benth. in DC. Prod. x. 408; Torrenia fimbriata, Grah. in Edinb. New Phil. Journ. xi. 379; T. scabra, Grah. in Bot. Mag. t. 3104.*

Hab.: Coastal swamps from the Tweed to Cape York.

## 15. VANDELLIA, Linn.

(After Dominico Vandelli.)

Calyx either divided to the base into 5 narrow segments, or the segments more or less cohering into a short 5-toothed calyx. Corolla tubular at the base, the upper lip erect, shortly 2-lobed, the lower lip larger, spreading, 3-lobed. Perfect stamens 4, the anthers cohering in pairs, with divaricate cells, the upper stamens included in the tube; filaments of the lower ones adnate to the throat, long and arched, with an angle tooth or linear lobe near the base. Style with 2 flat stigmatic lobes. Capsule globular oblong or linear, opening in 2 entire valves parallel to the thin dissepiment.—Slender herbs, erect or diffuse and much-branched, glabrous or pubescent. Leaves opposite, undivided. Flowers opposite, or alternate by the abortion of one of each pair, axillary or in terminal racemes, the racemes sometimes contracted into umbels, without bracteoles.

The genus comprises a considerable number of species, mostly common weeds in the tropical and subtropical regions of the Old World, two of them being also found in S. America. Of the 4 following species, one is the commonest over the whole range of the genus; the others appear to be all endemic.

Calyx-segments united in a 5-toothed calyx, at least at the time of flowering.

Stems diffuse. Leaves ovate . . . . . 1. *V. crustacea*.

Calyx-segments separate from the fruit.

Leaves ovate, chiefly near the base of the stem. Plant glabrous.

Corolla-tube rather longer than the calyx . . . . . 2. *V. alsinoides*.

Corolla-tube fully twice as long as the calyx . . . . . 3. *V. scapigera*.

Leaves linear-subulate, few and mostly small . . . . . 4. *V. subulata*.

1. ***V. crustacea*** (crustaceous), *Benth. Scroph. Ind. and in DC. Prod. x. 413; Fl. Austr. iv. 496.* A diffuse much-branched annual, glabrous or with a very few small scattered hairs, usually not exceeding 6in. but attaining nearly 1ft. when very luxuriant. Leaves shortly petiolate, ovate, broadly crenate or almost entire, sometimes almost cordate at the base, from under  $\frac{1}{2}$ in. to about  $\frac{3}{4}$ in. long. Pedicels usually  $\frac{1}{2}$  to nearly 1in. long, axillary or forming loose leafy



racemes. Calyx about 2 lines long, membranous and 5-toothed, with 5 scarcely prominent nerves at the time of flowering, often splitting into 5 segments when the flowering is over. Corolla scarcely twice as long as the calyx. Capsule ovoid or almost oblong, shorter than or as long as the calyx.—Wight, Ic. t. 863; *Capraria crustacea*, Linn., and the numerous synonyms quoted in DC. Prod. as above; *Torenia flaccida* and *T. scabra*, R. Br. Prod. 440; *V. Brownii*, Benth. in DC. Prod. x. 413; Rumph. Herb. Amb. v., t. 170, fig. 3.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks and Solander*; Wide Bay, *Bidwill*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Burdekin River and Broudsound, *Bowman*; Rockhampton, *O'Shanesy*.

The species is very common in tropical Asia, extending into tropical Africa and America.

2. **V. alsinoides** (Alsine-like), *Benth. in DC. Prod. x. 415, and Fl. Austr. iv. 497*. A slender branching erect or diffuse annual, usually glabrous and not exceeding 6in. Stem-leaves chiefly in the lower part of the plant, very shortly petiolate, broadly ovate or nearly orbicular, angular-toothed, thin and membranous, the larger ones 6 to 8 lines diameter, the floral ones very small or reduced to small bracts. Flowers small, on slender pedicels of  $\frac{1}{2}$  to 1in. reflexed after flowering, and usually one only to each pair of floral leaves. Calyx about  $1\frac{1}{2}$  line long, divided to the base into linear-subulate segments. Corolla-tube rather longer than the calyx, the upper lip short, the lower not so long as the tube. Appendage of the lower filaments linear, glandular. Capsule ovoid-oblong, rather longer than the calyx.—*Lindernia alsinoides*, R. Br. Prod. 441; *Tittmannia alsinoides*, Spreng. Syst. ii. 800; *Ilyogeton alsinoides*, Endl. in Walp. Rep. iii. 297.

Hab.: Facing Island, *R. Brown*; Wide Bay, *Bidwill*; Lizard Island, *McGillicray*; Moreton Bay, *C. Stuart*; Rockhampton, *O'Shanesy*.

3. **V. scapigera** (scape-like stems), *Benth. in DC. Prod. x. 415, and Fl. Austr. iv. 497*. Stems branching at the base, ascending or erect, very slender, 6in. high or more, the whole plant glabrous. Leaves chiefly collected at the base of the stems, ovate, entire, under  $\frac{1}{2}$ in. long, the lowest broader and contracted into a short petiole, and 1 or 2 pairs higher up quite sessile, the floral ones very small and distant. Pedicels slender, 1 to 2 lines long, usually 1 only to each pair of floral leaves. Calyx divided to the base into linear-segments scarcely 1 line long when in flower, rather longer afterwards. Corolla-tube about 2 lines long. Capsule ovoid-oblong, as long as the calyx.—*Lindernia scapigera*, R. Br. Prod. 441; *Tittmannia scapigera*, Spreng. Syst. ii. 800; *Ilyogeton scapigerum*, Endl. in Walp. Rep. iii. 297.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

Very near *V. alsinoides*, but more slender, the calyx smaller and the corolla larger.—*Benth.*

4. **V. subulata** (awl-shaped), *Benth. in DC. Prod. x. 415, and Fl. Austr. iv. 497*. Stems numerous, slender, erect, glabrous, usually branched, often attaining 1ft. Leaves linear-subulate, entire, the lower ones often  $\frac{1}{2}$ in. long, the upper ones few and small, the floral ones setaceous. Pedicels filiform, often above 1in. long, usually one only to each pair of floral leaves, but the uppermost often collected in a cluster or almost an umbel, with many minute floral leaves at their base. Calyx divided into linear-subulate segments, scarcely above 1 line long. Corolla fully 5 lines long. Capsule ovoid-oblong.—*Lindernia subulata*, R. Br. Prod. 441; *Tittmannia subulata*, Spreng. Syst. ii. 801; *Ilyogeton subulatum*, Endl. in Walp. Rep. iii. 297.

Hab.: Endeavour River, *Banks and Solander*, *A. Cunningham*.

## 16. BONNAYA. Link and Otto.

(After — Bonnay, a German botanist.)

Calyx divided to the base or nearly so into 5 narrow segments. Corolla tubular at the base, the upper lip erect, shortly 2-lobed, the lower larger, spreading, 3-lobed. Perfect stamens 2, included in the tube, the anthers cohering, with divaricate cells, the lower pair reduced to staminodia adnate to the throat, the ends either scarcely prominent or linear, entire obtuse and glandular. Style with 2 small flat stigmatic lobes. Capsule linear, longer than the calyx, opening in 2 entire valves parallel to the thin dissepiment.—Annuals usually glabrous. Leaves opposite. Flowers axillary or in terminal racemes, without bracteoles.

A small genus, spread over tropical and subtropical Asia.

Stems diffuse, leafy. Staminodia free at the end, erect linear and obtuse 1. *B. veronicæfolia*.  
Stems erect. Leaves oblong-obtuse, sharply serrate . . . . . 2. *B. brachiata*.

1. ***B. veronicæfolia*** (Veronica-leaved), *Spreng.*; *Benth in DC. Prod.* x. 421, and *Fl. Austr.* iv. 498. A glabrous annual, much-branched, diffuse and rooting at the lower nodes, the flowering branches often ascending to 6in. or more. Leaves sessile or narrowed into a short stem-clasping petiole, oblong-lanceolate or almost linear, the lower ones 1 to 1½in. long, entire or serrate, and often rather thick. Flowers in terminal racemes, on spreading stiff pedicels of 3 to 6 lines, which are usually angular and thickened upwards, the subtending floral leaves reduced to minute bracts. Calyx narrow, 1 to 1¾ line long, the segments sometimes united at the base. Corolla about twice as long as the calyx. Capsule linear, nearly ½in. long.—*Wight, Ic. t.* 1411 and 1412; *B. verbenæfolia*, *Benth. in DC. Prod.* x. 421, with the numerous synonyms given under both names; *Gratiola veronicæfolia*, *Roxb. Pl. Corom. t.* 154; *Lindernia veronicifolia*, *F. v. M. Fragm. vi.* 101.

Hab.: Rockhampton, *O'Shanesy*.

Common in tropical Asia, extending northwards to Loochoo.

2. ***B. brachiata*** (brachiate), *Link and Otto, Ic. Pl. Sel. i.* 25 t. 11. An erect rather rigid, diffusely branched herb, 4 to 10in. high, branches decumbent. Leaves sessile, oblong obtuse or acute, deeply serrate with close sharp teeth, margins thickened, ½ to 1½in. long. Racemes sometimes 4in. long. Flowers opposite, bracteate. Pedicels short, rigid. Corolla red or white, 3 lines long. Capsule ½in. long, slender, spreading or erect.—*B. serrata*, *Griff.*; *Gratiola serrata*, *Roxb. Fl. Ind. i.* 139; *B. brachiata* and *pusilla*, *Benth. Scroph. Ind.* 32, 33; *Rheede, Hort. Mal. ix. t.* 59; *Hook. Fl. Brit. Ind. iv.* 284.

Hab.: Given as a Queensland plant in *F. v. M. Cens. Austr. Pl.*

## 17. MICROCARPÆA, R. Br.

(Small fruit.)

Calyx tubular, 5-angled, 5-toothed. Corolla with a short tube and 5 nearly equal lobes (the 2 upper more united, the lowest rather larger). Stamens 2; filaments filiform; anthers 1-celled (by the confluence of 2 divaricate cells). Ovary completely 2-celled. Style short, dilated upwards into a broad spatulate lamina curved over the stamens. Capsule ovoid, included in the calyx, opening loculicidally in 2 entire valves, leaving the transverse dissepiment free.—Small creeping herb. Leaves opposite. Flowers very small, axillary, without bracteoles.

The genus, as now constituted, is limited to the single Australian species, which extends into tropical Asia. If, however, the dehiscence of the capsule be neglected, it might include *Peplidium*, and even *Glossostigma* might be added as a section, differing chiefly in the calyx.—*Benth.*

1. **M. muscosa** (moss-like), *R. Br. Prod.* 436; *Benth. Fl. Austr.* iv. 501. A dwarf slender intricately-branched prostrate plant, creeping and rooting at the nodes, nearly glabrous or the margins of the leaves, angles of the stems and calyxes ciliate with small rigid hairs. Leaves sessile, linear, narrow-oblong or linear-lanceolate, obtuse, entire, under 2 lines long. Flowers all but sessile in the axils, usually one only to each pair of leaves. Calyx  $\frac{3}{4}$  line long, prominently angled, with 5 acute ciliate teeth. Corolla-tube shorter than the calyx and the lobes very shortly exceeding it. Stamens nearly as long as the corolla. Capsule much shorter than the calyx.—*Benth.* in *DC. Prod.* x. 433.

Hab.: Shoalwater Bay, *R. Brown.*

## 18. PEPLIDIUM, Delile.

(Resembling Water Purslane.)

Calyx tubular, 5-angled, 5-toothed or shortly 5-lobed. Corolla with a short tube and 5 nearly equal lobes. Stamens 2, the filaments somewhat dilated at the base; anthers 1-celled (by the confluence of 2 divaricate cells?). Ovary completely 2-celled. Style short, dilated upwards into a broad spatulate lamina curved over the stamens. Capsule globular or ovoid, indehiscent or irregularly bursting (or sometimes 4-valved?).—Small creeping or prostrate herbs. Leaves opposite. Flowers very small, axillary, without bracteoles.

The genus is limited to the 2 Australian species, of which one is widely diffused over the warmer regions of Asia and Africa, the other is endemic. The genus ought, perhaps, to be reunited with *Microcarpæa*, in which Smith had placed the common species. The anthers appear to have been erroneously described as bilocular.—*Benth.*

Flowers sessile or nearly so. Capsule globular, obtuse . . . . . 1. *P. humifusum*

Flowers distinctly pedicellate. Capsule ovoid, acute . . . . . 2. *P. Muellieri*.

1. **P. humifusum** (creeping), *Delile*; *Benth.* in *DC. Prod.* x. 422, and *Fl. Austr.* iv. 500. A dwarf prostrate glabrous plant, creeping and rooting at the nodes, sometimes forming dense tufts of 2 or 3 in. diameter, sometimes spreading to a considerable extent. Leaves ovate obovate or orbicular, obtuse, entire, contracted into a short petiole, rather thick especially when small,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long or rarely rather larger (in very wet situations), the short petioles of each pair connected by their membranous margins. Flowers sessile or nearly so in the axils. Calyx scarcely above 1 line at the time of flowering, with 5 prominent angles or folds and membranous between them, the teeth short and obtuse. Corolla-tube rather shorter than the calyx, the lobes very short and rounded. Filaments rather thick, especially towards the base, angularly incurved. Capsule globular, large for the plant, very obtuse, enclosed in the distended calyx, about  $1\frac{1}{2}$  line diameter, membranous and indehiscent or at length bursting irregularly towards the base.—*Microcarpæa cochlearifolia*, Sm.; *Hook. Bot. Misc.* iii. 95. t. suppl. 29, and other synonyms quoted in the 'Prodromus.'

Hab.: Rockhampton, *O'Shanesey*; Cape River, *Bowman.*

The species extends over the greater part of tropical and subtropical Asia and Africa.

2. **P. Muellieri** (after F. v. Mueller), *Benth. Fl. Austr.* iv. 500. Stems procumbent, much firmer than in *P. humifusum*, and not rooting at the nodes, glabrous or sparingly scabrous-pubescent. Leaves petiolate, ovate or obovate, very obtuse, entire, rather thick, 4 to 8 lines long. Flowers usually 2 together in each axil, on pedicels of 1 to 2 lines. Calyx tubular,  $1\frac{1}{2}$  line long, 5-angled, with obtuse teeth. Corolla-tube nearly as long as the calyx; lobes oval-oblong, at least half as long as the tube, with 2 very prominent ridges (rudiments of

staminodia?) in the throat opposite the sinus of the lower lobes, which are entirely wanting in *P. humifusum*. Filaments scarcely curved. Capsule ovoid, acute, readily opening in 2 or 4 valves, although not quite ripe in our specimens.

Hab.: In company with the above.

Several specimens of this are in the Hookerian herbarium, sent by F. v. Mueller as a large-leaved variety of *P. humifusum*; but, besides the foliage, the pedicellate and longer flowers, the shape of the corolla, the stamens and the fruit appear to me to be quite different from those of *P. humifusum*, which is remarkably constant in its character throughout its very extended range.—*Benth.*

## 19. GLOSSOSTIGMA, Arn.

(Stigma tongue-like.)

(*Tricholoma*, *Benth.*)

Calyx campanulate, obtusely 3 or 4-lobed, the upper lobes sometimes slightly notched. Corolla very small, with a short tube and 5 nearly equal lobes (the 2 upper more united, the lowest rather larger). Stamens 2 or 4; filaments filiform; anthers 1-celled (by the confluence of 2 diverging or divaricate cells). Style short, dilated upwards into a broad spatulate lamina curved over the stamens in the bud. Capsule globular or ovoid, included in the calyx, opening loculicidally in 2 entire valves, leaving the placental column free.—Small creeping herbs. Leaves opposite but often clustered at the nodes. Flowers very small, on axillary pedicels, without bracteoles.

The genus is apparently limited to 3 species, of which one extends to tropical Asia and Africa, another to New Zealand (not as yet found in Queensland), and the third is endemic. It differs from *Microcarpæa* in the calyx, from *Limosella* in the opposite leaves, in the calyx, style, ovary and capsule.

Stamens 2 (**Glossostigma**) . . . . . 1. *G. spathulatum*.

Stamens 4 (**Tricholoma**). Calyx usually 3-lobed. Stamens as long as or exceeding the very short corolla-lobes . . . . . 2. *G. Drummondii*.

1. **G. spathulatum** (spathulate), *Arn.: Benth. in DC. Prod. x. 426*, and *Fl. Austr. iv. 501*. A very slender and minute intricately-branched glabrous plant, creeping and rooting at the nodes. Leaves linear-spathulate, obtuse, entire, 1 to 2 lines long, but usually tapering into a much longer petiole. Pedicels slender, scarcely exceeding the leaves. Calyx scarcely above  $\frac{1}{2}$  line long, 3-lobed. Corolla scarcely exceeding the calyx, with very small blue entire lobes. Stamens 2, nearly as long as the corolla. Capsule not exceeding the calyx, opening loculicidally in 2 valves.—*Microcarpæa spathulata*, *Hook. Bot. Misc. ii. 101. t. suppl. 4*.

Hab.: Rockhampton, *O'Shanesy*, who observes that the numerous little blue flowers look like tiny drops of dew.

The species is dispersed over tropical Asia and Africa.

2. **G. Drummondii** (after James Drummond), *Benth. in DC. Prod. x. 426 Fl. Austr. 502*. A minute glabrous plant, creeping and rooting at the nodes like *G. spathulatum*. Leaves linear-spathulate or oblong, entire, 1 to 2 lines long, but narrowed into a slender petiole sometimes much longer than the lamina. Pedicels usually longer than the leaves. Calyx scarcely above  $\frac{1}{2}$  line long, 3-lobed as in *G. spathulatum*, one lobe often broader than the others. Corolla slightly exceeding the calyx, with short rounded lobes not fringed. Stamens 4, as long as or sometimes longer than the corolla. Capsule nearly globular, not exceeding the calyx, opening loculicidally in 2 valves.

Hab.: Recorded for Queensland (without locality) by *F. v. Mueller*.

## 20. LIMOSELLA, Linn.

(From *limus*, a marsh, place of growth.)

Calyx campanulate, 5-toothed or lobed. Corolla broadly campanulate or almost rotate, with 5 nearly equal lobes. Stamens 4. Anthers 1-celled (by the confluence of 2 divaricate cells). Ovary 2-celled at the base only. Style short, thickened at the end. Capsule globular, membranous, scarcely dehiscent or opening in 2 valves parallel to the very incomplete dissepiment.—Small herbs, tufted creeping or floating. Leaves clustered or alternate on short barren shoots. Peduncles usually very short, clustered with the leaves, without bracteoles. Flowers in the common species very small, larger in some S. African ones.

Besides the Queensland species, which is endemic, there is another Australian species which appears to be the same as the one which spreads over the northern hemisphere and the whole of Western America, there are one or two from S. Africa with much larger flowers and broader leaves.—*Benth. (in part).*

1. **L. Curdieana** (after Dr. Daniel Curdie), *F. v. M. Fragm.* ix. 166. Perennial, root-stock somewhat thickened, stoloniferous, petioles nearly terete, attaining 6 or more inches in length, about 1 line in thickness. Leaves ovate, floating, about 1 in. long. Flowers in clusters, nearly sessile at the base of the petioles. Calyxes attaining 2 or 3 lines, with 5 somewhat acute teeth, fleshy, almost valvate in the bud. Corolla included in the calyx, scarcely 1 line long; lobes whitish-green, pilose on the upper side, slightly imbricate or almost valvate. Stamens 4, didymous, inserted in the throat of the corolla; filaments short; anthers oval-reniform; 1-celled dorsifixed. Style slender, filiform, scarcely  $\frac{1}{2}$  line long. Stigma finely papillose. Capsule 2 lines long, ovate-globose, 1-celled, with numerous finely netted ellipsoid seeds.

Hab.: Recorded for Queensland by *F. v. Mueller*.

## 21. SCOPARIA, Linn.

(Broom-like.)

Calyx divided to the base into 4 or 5 segments. Corolla rotate, 4-lobed, hairy at the throat, the lobes imbricate in the bud. Stamens 4; anthers sagittate. Style slightly club-shaped at the top, truncate or emarginate. Capsule opening septicidally in 2 entire valves, leaving the placental column free.—Much-branched herbs or low undershrubs. Leaves opposite or whorled. Pedicels axillary, usually 2 together, without bracteoles.

The genus consists of but few species, all South American, including the Australian one, which is now a common weed in almost all tropical regions.

1. **S. dulcis** (sweet), *Linn.; Benth. in DC. Prod.* x. 431, and *Fl. Austr.* iv. 504. A much-branched glabrous annual (or sometimes perennial?), erect or decumbent at the base, 1 to 3 ft. high. Leaves usually in whorls of 3, oblong-lanceolate or the upper ones linear in the Australian specimens, the lower ones broader, in some American ones dentate, narrowed into a petiole often rather long, the lamina varying from  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. Flowers numerous, small, white, on filiform pedicels of 2 to 4 lines. Calyx-segments 4, ovate-oblong, about 1 line long. Corolla about 3 lines diameter. Capsule rather longer than the calyx.—*R. Br. Prod.* 443; *Gært. Fruct.* i. 251. t. 53. fig. 10.

Hab.: Gulf of Carpentaria, *F. v. Mueller*; Cairns, *E. Cowley*; Broadsound, *R. Brown, Bowman*; Shoalwater Bay, *R. Brown*; Lizard Island, *M'Gillivray*; Nerkool Creek, *Bowman*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy, O'Shanesy*; Bundaberg, *Rev. B. Scortechini*.

The species is supposed to be of American origin, now a common tropical weed.

## 22. VERONICA, Linn.

(Derivation doubtful.)

Calyx deeply divided into 4 or rarely 5 segments. Corolla either rotate or with a distinct tube and spreading limb; lobes 4 or very rarely 5, imbricate in the bud, the lateral ones or one of them outside. Stamens 2, inserted in the tube and exserted from it; anthers with confluent cells, without points or awns. Style filiform, with an undivided somewhat capitate stigma. Capsule compressed or turgid, furrowed on each side, either septicidally dehiscent with the placentas separating or loculicidally dehiscent with the valves remaining adherent to the undivided placental column, or separating from it and septicidally bifid. Seeds ovate or orbicular, compressed, attached by the inner flat concave or slightly convex surface, the outer surface more or less convex.—Herbs undershrubs or shrubs. Leaves opposite or rarely the upper ones alternate, the floral leaves or bracts always alternate. Flowers blue pink or white, solitary in the axils of the floral leaves and bracts, without or very rarely with bracteoles, forming usually terminal or axillary racemes.

A large genus, abundant in the temperate and colder regions of the northern hemisphere, in New Zealand, and the Antarctic regions, ascending to great elevations and high latitudes, with a very few tropical species, and those chiefly in mountain regions or descending along streams.

SECT. I. **Hebe**.—Evergreen shrubs or densely tufted or tall and erect herbs. Leaves all opposite. Flowers in axillary racemes, very rarely reduced to single flowers. Capsule more or less turgid and septicidally dividing when ripe, at least at the top.

Stems from a perennial base tall, simple or nearly so. Racemes elongated, many-flowered. Leaves broadly lanceolate, serrate . . . . . 1. *V. Derwentia*.

SECT. II. **Chamædrys**.—Herbs from a perennial usually creeping rootstock, diffuse, ascending or erect. Leaves all opposite. Flowers in axillary racemes. Capsule compressed, the valves not separating from the placental columns.

Leaves broadly ovate, petiolate, rounded truncate or cordate at the base, mostly  $\frac{1}{2}$  to lin. long.

Stems hirsute with long hairs, long and procumbent or short and erect.

Calyx-segments large, obtuse, ciliate . . . . . 2. *V. calycina*.

Stems slender, shortly pubescent, long and procumbent, rarely short and erect.

Calyx-segments rather acute . . . . . 3. *V. plebeia*.

Leaves ovate-lanceolate, 1 to 3 in. long. Stems erect, often tall, loosely pubescent or hirsute . . . . . 4. *V. notabilis*.

SECT. III. **Veronicastrum**.—Annual or perennial herbs, usually decumbent or small. Stem-leaves opposite, passing into the alternate floral leaves or bracts. Racemes or spikes terminal, simple, the lower bracts like the stem-leaves. Capsule as in *Chamædrys*.

Plants perennial, decumbent, and rooting at the base. Flowers distinctly pedicellate . . . . . 5. *V. serpyllifolia*.

Annual. Flowers sessile or nearly so . . . . . 6. *V. peregrina*.

All the Queensland species, have the corolla rotate or nearly so, with a very short tube, and none have bracteoles; the bracts subtending the pedicels are small and narrow in all except the section *Veronicastrum*.

1. **V. Derwentia** (an old generic name), *Andr. Bot. Rep. t. 531; Benth. Fl. Austr. iv. 507*. Stems from a perennial base erect, simple, 2 to 3 ft. high, glabrous as well as the foliage except a few cilia at the junction of the leaves, and sometimes a slight pubescence in 2 decurrent lines on the stem, or the inflorescence shortly pubescent. Leaves sessile, broadly lanceolate, acuminate, serrate, attaining 3 or 4 in. Flowers pale-blue or white, rather crowded, in racemes often 6 to 8 in. long in the upper axils. Calyx about  $1\frac{1}{2}$  line long, divided to below the middle into 4 lanceolate or almost linear lobes, with usually a small upper fifth lobe. Corolla-lobes rather broad, acute, nearly 3 lines long, not very unequal but obscurely arranged in 2 lips. Capsule ovoid or oblong, obtuse or acute, turgid at the base, exceeding the calyx, readily septicidal.—*V. labiata*, R. Br. Prod. 431; Benth. in DC. Prod. x. 463; Hook. f. Fl. Tasm. i. 293; Bot. Mag. t. 1660, and 3461.

Hab: Darling Downs.

2. **V. calycina** (calyx enlarging after flowering), *R. Br. Prod.* 435; *Benth. Fl. Austr.* iv. 509. Stems from a creeping rootstock either procumbent, spreading to a considerable extent and rooting at the lower nodes, or some of the flowering ones usually ascending or erect, from a few inches to nearly 1 ft. long, more or less hirsute, the hairs usually rather long and in 2 opposite rows but sometimes nearly all round the stem. Leaves more petiolate than in the preceding species, broadly ovate, coarsely crenate-toothed, rounded truncate or cordate at the base, from under  $\frac{1}{2}$  in. to 1 in. or rarely rather more in length and often almost as broad, the floral ones smaller and sometimes more sessile and narrower. Flowers in the ascending stems in pedunculate few-flowered rather loose axillary racemes, or on the procumbent stems almost reduced to clusters, the pedicels long with a very short common peduncle. Calyx-segments broadly ovate, obtuse, ciliate, usually about 2 lines long when in flower but soon enlarged and sometimes twice that size and thin. Corolla-lobes obtuse, either scarcely exceeding the calyx or twice as long. Capsule compressed, broadly obcordate or truncate, shorter than the calyx.—*Benth. in DC. Prod.* x. 477; *Hook. f. Fl. Tasm.* i. 294; *V. stolonifera*, *Lehm. Del. Sem. Hort. Hamb.* 1842, and in *Pl. Preiss.* i. 342, *Benth. in DC. Prod.* x. 477 and 490 (from the character given); *V. cynorum*, *Miq. in Pl. Preiss.* i. 342 (from the character given); *V. Gunnii*, *Benth. in DC. Prod.* x. 477.

Hab.: Burnett River, *F. v. Mueller*.

3. **V. plebeia** (common), *R. Br. Prod.* 435; *Benth. Fl. Austr.* iv. 510. Stems from a creeping rootstock procumbent, elongated and much more slender than in the other species, sometimes several feet long, occasionally rooting at the nodes, rarely emitting a tuft of erect branches of a few inches, usually minutely pubescent, without the long hairs of *V. calycina*. Leaves on rather long petioles, broadly ovate sometimes almost deltoid, deeply acutely and irregularly toothed, truncate or broadly cordate at the base, from under  $\frac{1}{2}$  in. to about 1 in. long. Racemes as in *V. calycina*, sometimes rather slender pedunculate and 2 or even 3 in. long with the pedicels not much longer than the calyx, sometimes almost reduced to clusters of 2 or 3 flowers on long pedicels with a very short common peduncle. Calyx-segments about 2 lines long when in flower, and rarely above 3 when in fruit, rather acute and minutely ciliate. Corolla not much longer than the calyx. Capsule shorter than the calyx, compressed, nearly orbicular, not at all or only very slightly emarginate.—*Benth. in DC. Prod.* x. 478; *V. deltoidea*, *Spreng. Syst. Cur. Post.* 17.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*, *C. Stuart*; Maranoa River, *Mitchell*; common in southern localities.

The New Zealand *V. elongata*, *Benth.* (*V. calycina*, *A. Cunn. in Bot. Mag.* under n. 3461), does not appear to be really distinct from *V. plebeia*.—*Benth.*

4. **V. notabilis** (notable), *F. v. M. Herb.*; *Benth. Fl. Austr.* iv. 511. Stems from a creeping or decumbent base, ascending or erect, 1 ft. high or more, often much stouter than in the preceding species, loosely pubescent or hirsute. Leaves petiolate, ovate-lanceolate or lanceolate, acute and acutely toothed, 1 to 3 in. long. Racemes in the upper axils loose, 3 to 8 in. long, the pedicels usually longer than the calyx. Calyx-segments rather acute, 2 lines long when in flower, lengthening to 3 lines in fruit. Corolla not much exceeding the calyx, but not seen very perfect. Capsule shorter than the calyx, broad, truncate, or slightly notched.

Hab.: Near Wallangarra.

This species, which had been determined by A. Cunningham to be the *V. arguta* of Brown, and was included under that name by Bentham in the "Prodromus" and by Hooker in the "Tasmanian Flora," proves to be very different from Brown's plant, and apparently as distinct a species as any of the *Chamædrys* group in Australia except *V. nivea* (which has not as yet been met with in Queensland).

5. **V. serpyllifolia** (Serpillum-leaved), *Linn.*; *Benth. in DC. Prod.* x. 432; and *Fl. Austr.* iv. 511. A perennial with shortly creeping very much branched stems, forming a small flat dense leafy tuft, the flowering branches ascending from 2 in. to nearly  $\frac{1}{2}$  ft., the whole plant minutely pubescent or nearly glabrous. Lower leaves shortly petiolate, the upper ones sessile or nearly so, ovate, obtuse, slightly crenate, rarely exceeding  $\frac{1}{2}$  in. Flowers very small, of a pale-blue or white with darker streaks, on pedicels from 1 to  $1\frac{1}{2}$  line, or rarely nearly sessile, in a simple terminal raceme or spike, the subtending bracts, especially the lower ones, rather large and leaf-like and passing into the stem leaves. Calyx but little more than 1 line long at the time of flowering, somewhat enlarged in fruit. Corolla scarcely exceeding the calyx. Capsule broad, compressed, often rather deeply notched.

Hab.: Near Wallangarra.

The species is common in the temperate and colder regions of both the northern and southern hemispheres ascending to high latitudes and great elevations, and also in mountain ranges within the tropics.—*Benth.*

6. **V. peregrina** (habit diffuse), *Linn.*; *Benth. in DC. Prod.* x. 482; and *Fl. Austr.* iv. 511. An annual with erect or ascending stems, simple or branching at the base, glabrous or minutely glandular-pubescent, usually about 6 in. high, but lengthening occasionally to 1 ft. Radical and lowest leaves petiolate and ovate but soon dying off, the others sessile, oblong or linear, entire or serrate, rarely exceeding  $\frac{1}{2}$  in., passing into smaller alternate linear floral leaves or bracts. Flowers small, pale-blue or white, sessile in the axils of the floral leaves or bracts, forming a terminal interrupted leafy spike. Calyx segments oblong, but little more than 1 line long, slightly enlarged after flowering. Corolla not exceeding the calyx. Capsule, about as broad as long, compressed, slightly notched, about  $1\frac{1}{2}$  line diameter. Seeds very small.

Hab.: Southern localities.

The species is common in extratropical America, rather less abundant within the tropics, and appears here and there in the Old World introduced from America, and may have been introduced into Australia.

## 23. BUCHNERA, Linn.

(After J. G. Buchner.)

Calyx tubular, obscurely nerved, shortly 5-toothed. Corolla-tube slender, straight or slightly curved, the limb with 5 almost equal obovate or oblong spreading lobes, the 2 upper ones inside in the bud. Stamens 4, in pairs, included in the tube; anthers 1-celled, vertical. Style club-shaped at the top, entire. Capsule straight, not acuminate, opening loculicidally in 2 entire valves.—Stiff erect herbs, usually drying black. Lower leaves opposite, the upper ones alternate. Flowers sessile, forming terminal dense or interrupted spikes, with a pair of bracteoles under the calyx.

The genus is widely dispersed over the tropical and subtropical regions of Asia, Africa, and America. The limits of the species are exceedingly difficult to determine, and the Australian ones may be considered either as all endemic or nearly so, or all except *B. tetragona* may be referred as varieties to a single species common in tropical Asia and Africa and very near to a common American one.—*Benth.*

Flowers in short dense 4-sided spikes, the imbricate bracts very broad and as long as the calyx . . . . .

1. *B. tetragona*.

Flowers in slender interrupted spikes, the bracts either narrow or much shorter than the calyx.

Radical and lower leaves broad, rosulate; upper ones narrow, acute.

Corolla glabrous . . . . . 2. *B. urticifolia*.



Leaves all narrow, the lower ones oblong, the upper ones linear, mostly acute. Corolla glabrous.

Corolla-tube 3 to 4 lines long . . . . . 3. *B. linearis*.

Corolla-tube not 2 lines long . . . . . 4. *B. tenella*.

Leaves all narrow and obtuse, usually hoary, the lower ones oblong.

Stems simple. Corolla glabrous outside . . . . . 5. *B. gracilis*.

Stems branching. Corolla pubescent or hispid outside . . . . . 6. *B. ramosissima*.

1. **B. tetragona** (4-angled), *R. Br. Prod.* 437; *Benth. Fl. Austr.* iv. 514. Erect tall and stout, some specimens simple and fully 2ft. high, others smaller and branched, and all quite glabrous. Lower leaves ovate or oblong, obtuse, coarsely and irregularly sinuate toothed, narrowed into a short broad petiole and sometimes 3 to 4in. long, upper ones lanceolate and sometimes all under 2in. Spikes usually 3 to 5 together, almost sessile within the last pair of leaves, very thick and  $1\frac{1}{2}$  to 2in. long, the flowers densely imbricate in 4 rows, each one sessile within a bract 2 to 3 lines long, much broader than long, very shortly acuminate in the middle. Bracteoles narrow, complicated, acuminate, as long as the calyx. Calyx,  $2\frac{1}{2}$  lines, not at all or scarcely compressed, the lobes narrow, very acute, nearly as long as the tube. Corolla-tube slender, nearly 4 lines long, the lobes broad, nearly equal, spreading to 3 or 4 lines diameter. Capsule oblong, rather longer than the calyx.—*Benth.* in *DC. Prod.* x. 495.

Hab.: Endeavour River, *Banks and Solander*; Cape York and the islands of Torres Straits. Allied to the E. Indian *B. tetrastricha*, but readily distinguished by the smoothness of the whole plant as well as by the calyxes and bracts.—*Benth.*

2. **B. urticifolia** (Nettle-leaved), *R. Br. Prod.* 437; *Benth. Fl. Austr.* iv. 514. Scabrous-pubescent or nearly glabrous. Stems erect and simple or branching and slightly decumbent at the base, rather slender, often above 1ft. high. Radical and lower leaves almost rosulate at the base of the stem, obovate or broadly oblong usually sessile, obtuse, entire, or slightly sinuate-toothed, 1 to  $1\frac{1}{2}$  or rarely 2in. long; stem leaves narrower, the upper ones linear or linear-lanceolate, acute. Flowers purplish or nearly white, in slender interrupted terminal spikes. Bracts mostly ovate, acute, ciliate, about half as long as the calyx or the lower ones longer and narrower; bracteoles similar, but smaller. Calyx narrow, rarely 2 lines long, the teeth acute. Corolla glabrous outside, the tube slender, not twice as long as the calyx. Capsule oblong, obtuse, either equal to or rather exceeding the calyx.—*Benth.* in *DC. Prod.* x. 496; *Endl. Iconogr.* t. 78.

Hab.: Common along the coast, *R. Brown and others*; from Cape York, *Damel*, to Moreton Bay, *F. v. Mueller*.

The common E. Indian *B. hispida* differs chiefly in being much more hirsute. The African *B. leptostachya* can scarcely be distinguished from some forms of the species, which might indeed include, as slight varieties, the following four.—*Benth.*

3. **B. linearis** (leaves narrow) *R. Br. Prod.* 437; *Benth. Fl. Austr.* iv. 515. Scabrous-pubescent. Stems erect, simple or slightly branched, often exceeding 1ft. the upper leaves linear and acute as in *B. urticifolia*, and sometimes the lower ones scarcely broader, but usually those near the base of the stem are oblong, obtuse, often obscurely toothed, narrowed into a petiole and not sessile nor rosulate. Flowers and fruit the same as in *B. urticifolia*, or rather larger. *Benth.* in *DC. Prod.* x. 497.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

Var. *asperata*. *B. asperata*, *R. Br. Prod.* 438; *Benth.* in *DC. Prod.* x. 496, appears to be a rather larger, coarser, and more scabrous form of the same species.—*Bustard Bay and Bay of Inlets, Banks and Solander*.

4. **B. tenella** (slender) *R. Br. Prod.* 437; *Benth. Fl. Austr.* iv. 515. More slender than the other species, simple or branched, often 1ft. high or more, the foliage and the lower part of the plant sparingly hirsute, the upper

part often quite glabrous. Leaves all narrow and mostly narrow-linear and acute. Flowers yellowish-brown, smaller than in *B. linearis* and *B. urticifolia*, but otherwise similar, the corolla glabrous outside, the tube not 2 lines long.—Benth in DC. Prod. x. 497.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks and Solander*; Facing Island, *R. Brown*.

5. ***B. gracilis*** (slender), *R. Br. Prod.* 437; *Benth. Fl. Austr.* iv. 515. Very near *B. ramosissima*, with the same somewhat hoary indumentum and narrow obtuse leaves, but the stem slender, erect, usually simple or branching at the base only, and the corolla-tube glabrous outside or very rarely sprinkled with a few hairs at the top of the tube.—Benth. in DC. Prod. x. 497.

Hab.: Moreton Bay and Stanthorpe.

6. ***B. ramosissima*** (much-branched), *R. Br. Prod.* 438; *Benth. Fl. Austr.* iv. 515. Erect or decumbent at the base, more branching than the other species and usually more hoary with a short scabrous pubescence, sometimes under 6 in. but often attaining 1 ft. or more. Lower leaves oblong, obtuse, narrowed into a short petiole,  $\frac{3}{4}$  to 1  $\frac{1}{2}$  in. long; upper ones linear but almost always obtuse, and all usually quite entire. Bracts and bracteoles usually narrow and short. Calyx 2 to 3 lines long with acute teeth. Corolla-tube more or less exserted, always pubescent or hispid outside, especially at the top, the lobes narrow, about 1  $\frac{1}{2}$  line long. Capsule about as long as the calyx.—Benth. in DC. Prod. x. 496.

Hab.: Thirsty Sound, *R. Brown*; Port Denison, *Fitzalan*; Gracemere and near Rockhampton, *Bowman*.

Var. ? *parviflora*. Corolla much smaller, slightly pubescent outside.—*B. pubescens*, Benth. in DC. Prod. x. 496.—Endeavour River, *A. Cunningham*.

## 24. STRIGA, Lour.

(Plant bearing short stiff hairs.)

Calyx tubular-campanulate, with prominent nerves, 5-toothed or 5-lobed. Corolla-tube slender, abruptly bent at or above the middle, the limb 2-lipped, the upper lip emarginate or 2-lobed, innermost in the bud, the lower 3-lobed. Stamens 4, in pairs, included in the tube; anthers vertical, 1-celled. Style club-shaped at the top, entire. Capsule straight, not acuminate, opening loculicidally in 2 valves.—Rigid erect annuals, usually scabrous and drying black. Lower leaves opposite, upper ones alternate, sometimes, in species not Australian, all reduced to small scales. Flowers sessile, usually forming terminal interrupted spikes.

A genus of several species, dispersed over the tropical regions of the Old World, and all probably parasites on roots.

Calyx with 10 equally prominent ribs . . . . . 1. *S. hirsuta*;

Calyx with 5 prominent ribs, smooth between them or rarely here and there an obscure vein.

Corolla scarcely  $\frac{1}{2}$  in. long, the upper lip more than half as long as the lower . . . . . 2. *S. parviflora*.

Corolla nearly or fully  $\frac{3}{4}$  in. long, the upper lip less than half as long as the lower . . . . . 3. *S. curviflora*.

1. ***S. hirsuta*** (hairy), *Benth. in DC. Prod.* x. 502; *Fl. Austr.* iv. 516. An erect, scabrous or pubescent, simple or slightly branched annual, usually about 6 in. high, and not always drying so black as the other species. Leaves linear or the lower ones lanceolate. Flowers yellow red or white, in terminal interrupted spikes, the lower ones distant. Calyx variable in size, usually 2 to 2  $\frac{1}{2}$  lines long, with 10 very prominent scabrous or hispid nerves, one of them

very rarely here and there divided, the furrows between them very narrow. Corolla-tube glabrous, 4 to 5 lines long, bent near the top; the upper lip much shorter than the lower one.—*Campuleia coccinea*, Hook. Exot. Fl. t. 203.

Hab.: Burdekin River, *Bowman*.

Frequent in tropical Asia, extending westward into Africa, eastward to the Archipelago, and northward to S. China.—*Benth*.

2. **S. parviflora** (small flowered), *Benth. in Comp. Bot. Mag. and in DC. Prod.* x. 501; *Fl. Austr.* iv. 516. A very scabrous, erect, simple or slightly branched annual of 6 to 9 in. Leaves linear, usually short, the floral ones very narrow. Flowers small, blue, in more or less interrupted terminal spikes. Calyx 1 to  $1\frac{1}{2}$  line long, with 5 very scabrous and prominent ribs, and smooth between them and here and there with an imperfect row of minute prickles. Corolla scarcely 3 lines long, the tube bent near the top, the lobes all very short, but the upper lip more than half as long as the lower one. Capsule broad.—*Buchnera parviflora*, R. Br. Prod. 438.

Hab.: Keppel Bay, *R. Brown*; Peak Range, *Leichhardt*; Broadsound, Suttor and Bowen Rivers, Nerkool Creek, *Gracemere*, *Bowman*.

3. **S. curviflora** (corolla-tube curved), *Benth. in Comp. Bot. Mag. and in DC. Prod.* x. 501; *Fl. Austr.* iv. 517. Usually a much taller and stouter plant than *S. parviflora*, many of the specimens above 1 ft. high, simple and slightly branched and very scabrous. Leaves linear, the lower ones above 1 in. high. Flowers purplish in terminal interrupted spikes. Calyx 3 lines long or more, with long subulate-acuminate teeth, the tube with 5 prominent scabrous ribs, and smooth between them. Corolla pubescent, the tube 4 to 5 lines long, bent near the top, the lobes of the lower lip 3 to 4 lines long, the upper lip slightly notched, only 1 to  $1\frac{1}{2}$  line long, usually somewhat recurved.—*Buchnera curviflora*, R. Br. Prod. 438.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks and Solander*; Rockhampton, *O'Shanesy*; Cape York, *Daemel*.

## 25. RHAMPHICARPA, Benth.

(From *rhamphos*, a beak, and *karpos*, fruit; capsule beaked.)

Calyx campanulate, 5 lobed. Corolla tube long and slender, straight or slightly curved; lobes 5, obovate, nearly equal or the two upper (inside in the bud) rather smaller. Stamens 4, in pairs; anthers 1-celled, vertical, obtuse. Capsule ovate, compressed or turgid, acuminate, with a straight or oblique beak, opening loculicidally in 2 valves.—Erect branching glabrous herbs, drying black, perhaps parasitical. Lower leaves opposite, upper ones alternate, entire or the lower ones pinnately divided. Flowers in terminal racemes, usually without bracteoles.

A small genus, chiefly African, with one Asiatic species, the same as the Australian one.

1. **R. longiflora** (long flowers), *Benth. in Comp. Bot. Mag. and in DC. Prod.* x. 504; *Fl. Austr.* iv. 518. An erect slender but rigid branching annual, more or less scabrous, from under 6 in. to nearly 1 ft. high. Leaves pinnately divided into linear-subulate segments, rather short and distant, or sometimes again toothed or pinnate, the whole leaf usually above 1 in. long. Flowers in the upper axils, on pedicels from  $\frac{1}{2}$  to 1 in., without bracteoles. Calyx broadly campanulate, 2 to 3 lines long, the lobes ending in fine points. Corolla-tube slender, about 1 in. long when perfect, with a campanulate throat, the lobes broad, varying in size, but always 2 or 3 times shorter than the tube. Capsule

ovate, acuminate, without prominent margins, the beak nearly straight or somewhat oblique in the Australian form.—*R. fistulosa*, Benth in D.C. Prod. x. 504.

Hab.: Recorded for Queensland by *F. v. Mueller*.

The Australian specimens seem to connect the African *R. fistulosa*, which has usually the capsule bordered by a raised nerve or wing, but the beak straight, with the Asiatic *R. longiflora* (Wight, Ic. f. 1415), which has not the raised nerve, but the beak of the capsule more or less oblique or recurved. Neither character appears, however, to be quite constant, and the foliage and flowers are the same in all.—*Benth.*

## 26. CENTRANTHERA, R. Br.

(Anther spurred.)

Calyx compressed, obliquely acute, split down the lower edge, entire or 2 to 5-toothed at the top. Corolla with a curved tube dilated upwards, the limb spreading, with 5 broad lobes nearly equal or obscurely 2-lipped. Stamens 4, included in the tube; anthers in pairs, the cells transverse, with an awn-like point at the end, one cell usually smaller than the other or empty. Style with a lanceolate flattened stigmatic end. Capsule obtuse, opening loculicidally in 2 entire valves. Seeds minute, testa loose, reticulate; albumen scanty.—Scabrous herbs. Leaves opposite or the upper ones alternate. Flowers almost sessile, axillary or in interrupted terminal spikes with small bracteoles.

The genus consists of a few tropical Asiatic species, including the only Australian one. Probably several of them if not all are parasites.

1. **C. hispida** (rough), *R. Br. Prod.* 438; *Benth. Fl. Austr.* iv. 513. A stiff erect annual, simple or with spreading branches, 6in. to 1ft. high or rarely more, very scabrous with minute hairs or tubercles. Leaves mostly linear, entire, the longer ones 1 to 1½in. long, the upper ones much smaller. Flowers fugacious, nearly sessile in the upper axils, alternate and distant. Calyx herbaceous, 3 to 4 lines long. Corolla  $\frac{3}{4}$  to 1in. long, variously said to be pink purple or yellow. One cell of each anther much narrower than the other, with a long point. Capsule ovoid-globose.—*Wall. Pl. As. Rar.* t. 45; *Benth. in DC. Prod.* x. 525; *Digitalis stricta*, *Roxb. Fl. Ind.* iii. 99.

Hab.: Endeavour River, *Banks and Solander*; Brisbane River, Moreton Bay, *W. Hill*; Rockhampton and Rockingham Bay, *Dallachy*; very common on swampy land.

The species is widely distributed over tropical Asia, from Ceylon and the Peninsula to the Archipelago and northward to the Himalaya and S. China.

## 27. SOPUBIA, Hamilt.

(From the native name in Nepal.)

Calyx campanulate, with 5 teeth or lobes, valvate in the bud. Corolla broadly campanulate, nearly rotate or tapering into a short tube, with 5 flat spreading lobes nearly equal. Stamens 4, the anthers cohering in pairs, each with one ovate scarcely mucronate perfect cell, and one small stipitate empty cell. Style thickened and slightly flattened towards the end. Capsule ovate or oblong, truncate or notched, opening loculicidally in 2 entire or at length bifid valves.—Erect scabrous herbs, drying black. Leaves narrow, often divided, opposite, or the upper ones alternate.—Flowers yellow purple or pink, in terminal racemes or spikes, with a pair of bracteoles on the pedicel.

A small genus, dispersed over tropical Asia and Africa. The only Australian species is one of the Asiatic ones. The species are probably all parasitical.

1. **S. trifida** (3-fid), *Hamilt. in DC. Prod.* x. 522; and *Fl. Austr.* iv. 513. An erect rigid scabrous slightly branched annual of 1 to 3ft. Leaves narrow linear, the lower ones on the main stem often 3-fid, the upper ones and

those of the side branches entire,  $\frac{1}{2}$  to 1 in. long with smaller ones often clustered in the axils, the upper ones alternate. Flowers usually distant, forming a very loose terminal leafy raceme. Pedicels at first short, at length  $\frac{1}{2}$  in. long. Bracteoles linear, close under the calyx. Calyx 2 to  $2\frac{1}{2}$  lines long, with triangular acute lobes as long as the tube, woolly inside. Corolla with a very short tube, almost rotate, about  $\frac{1}{2}$  in. diameter, yellow with a purple centre or all purple. Capsule truncate, as long as the calyx.

Hab.: Tropical localities.

The species has a wide range in the hilly districts of India, extending to Ceylon, and (in a slight variety) to Madagascar.

## 28. EUPHRASIA, Linn.

(From *euphrasia*, joy; reputed virtues.)

Calyx tubular or campanulate, 4-lobed. Corolla tubular at the base, 2-lipped, the upper lip concave or hood-shaped, with 2 broad spreading lobes; the lower lip spreading, 3-lobed, overlapping the upper ones in the bud. Stamens 4 in pairs; anthers 2-celled, connivent under the upper lip of the corolla, the cells mucronate, often hairy. Style slightly dilated at the end, the stigma obtuse, entire or with a small upper lobe. Capsule oblong, compressed, opening loculicidally in 2 valves. Seeds oblong, striate.—Herbs either annual or perennial and branching at the base, believed to be often partially parasitical on roots. Leaves opposite, toothed or lobed. Flowers sessile or nearly so in short and dense or long and interrupted terminal spikes, the floral leaves or bracts usually more acute than the stem-leaves. Bracteoles none. Anther-cells equal in all the Australian species, unequal in some others.

The genus comprises a small number of very variable species distributed over the temperate and colder regions of the northern hemisphere, extratropical South America, and New Zealand.

Perennial, branching at the base with ascending or erect stems. Leaves narrow, pubescent or glabrous. Flowers variable in size, the spikes usually interrupted

1. *E. collina*.

Pubescent erect annual (usually above 6 in.), not drying so black as the perennials, and the corolla-lobes not so broad. Anthers very hairy. Flowers yellow. Teeth of the upper leaves rather acute

2. *E. scabra*.

1. ***E. collina*** (found on hills), *R. Br. Prod.* 436; *Benth. Fl. Austr.* iv. 520. Stems from a hard usually, if not always, perennial much-branched base, ascending or erect, from 6 in. to above 1 ft. high, glabrous or pubescent as well as the foliage, the inflorescence usually more or less glandular-pubescent. Leaves sessile or the lower ones narrowed into a short petiole, from oblong to 1 near-cuneate, obtuse and obtusely toothed at the end only or more frequently to near the base, usually  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, but larger in luxuriant specimens; the floral ones smaller broader and less toothed, the upper ones often entire (rarely cuneate and more deeply toothed?). Flowers purple bluish or white, sometimes mixed with yellow, rarely quite yellow, in terminal spikes, usually long and interrupted, with the flowers in distant pairs, at least when the flowering is advanced, rarely compact but occasionally remaining so even in fruit. Calyx usually about 2 lines long at first and lengthening to 3 lines, but very variable, the lobes acute or obtuse, equal to or shorter than the tube. Corolla-tube exerted, the throat broad, the lobes large but scarcely so long as the tube, the middle lower one emarginate, the others very obtuse or retuse, the whole corolla varying from  $\frac{1}{2}$  to  $\frac{3}{4}$  in. in length. Anthers hirsute. Capsule exceeding the calyx, shortly mucronate or rather acute.—*Benth in DC. Prod.* x. 553; *Hook. f. Fl. Tasm.* i. 296; *E. tetragona*, *R. Br. Prod.* 436; *Benth. l.c.*; *Bartl. in Pl. Preiss.* i. 343; *E. multicaulis*, *Benth. l.c.*; *Hook. f. Fl. Tasm.* i. 297.

Hab.: Between Stanthorpe and the border of N. S. Wales.

2. ***E. scabra*** (rough), *R. Br. Prod.* 437; *Benth. Fl. Austr.* iv. 521. An erect, rigid, simple or branched annual of  $\frac{1}{2}$  to 1ft., scabrous-pubescent and not drying so black as *E. collina* and its allies. Leaves oblong-lanceolate, with a few teeth more prominent and less obtuse than in *E. collina*, and the upper ones often acute, the stem-leaves rarely above  $\frac{1}{2}$ in. long, the floral ones narrow and more entire, the uppermost linear. Flowers yellow and scarcely or not at all streaked, in terminal spikes at first dense but at length often long and interrupted. Calyx narrow, glandular-pubescent, the lobes almost acute. Corolla-tube exceeding the calyx and dilated at the top, but not so much so as in *E. collina*, and the lobes very much shorter and entire, the whole corolla usually about  $\frac{1}{2}$ in. long. Anthers very hairy.—*Benth. in DC. Prod.* x. 554; *Hook. f. Fl. Tasm.* i. 297; *Bartl. in Pl. Preiss.* i. 343.

Hab.: Between Stanthorpe and the border of N. S. Wales.

## ORDER LXXXVIII. LENTIBULARIÆ.

Calyx free, with 2 to 5 segments lobes or teeth. Corolla irregular, the tube usually projecting into a spur or pouch at the base, the limb 2-lipped. Stamens 2, included in the tube and inserted at its base. Anthers 1-celled. Ovary superior, 1-celled, with several ovules attached to a free central placenta. Style short, with a 2-lipped stigma. Fruit a capsule. Seeds small, often minute, the testa usually reticulate, without albumen. Embryo with very short cotyledons or apparently undivided.—Herbs either aquatic or growing in marshes or wet places. Leaves radical or floating or none. Flowers solitary or several in a raceme, on leafless radical or terminal scapes or peduncles.

The Order, comprising but very few genera, is dispersed over the greater part of the globe.

### 1. UTRICULARIA, Linn.

(From *utriculus*, a little bladder.)

Calyx deeply divided into 2 lobes or segments. Corolla with a spur at the base rarely reduced to a small protuberance, the mouth of the tube usually closed or nearly so by a convex palate, the upper lip erect, broad, entire, sinuate or 2-lobed, the lower usually longer and broader, entire or 3-lobed (rarely 2-lobed or 4-lobed by the suppression or division of the middle lobe), with the lobes reflexed, or the whole lip spreading horizontally, with a convex palate at the base, often bearing a small 3-lobed protuberance. Capsule globular, opening in 2 valves.—Herbs either floating with submerged root-like leaves divided into capillary segments and interspersed with little vesicles or bladders full of air, or marsh-plants either leafless or with entire radical leaves. Peduncles or scapes radical or axillary. Flowers solitary or in a raceme, alternate or opposite, with a small scale-like bract under each pedicel and sometimes 1 or very few similar minute scales on the scape below the flowers. Bracteoles in many species 2 at the base of the pedicels, but very minute and often concealed within the bract.

A considerable genus, dispersed over nearly the whole globe except the extreme north and south, and especially numerous within the tropics both in the New and the Old World, several species having a very wide range. The corollas, from which some of the chief specific characters are drawn, are indeed of so delicate a nature that it is exceedingly difficult to ascertain their precise form in dried specimens; and it is to be feared that, in several of the following descriptions, slight inaccuracies may have crept in, which will have to be corrected chiefly from the examination of living plants.—*Benth.*

SECT. 1. ***Natantes***.—*Stems floating. Leaves submerged, divided into capillary segments mostly interspersed with bladders. Flowers yellow, on axillary peduncles.*

Peduncles bearing about the middle a cluster or false whorl of oblong or

linear vesicles . . . . . 1. *U. stellaris*.

Peduncles without vesicles.

Pedicels thickened and reflexed after flowering. Corolla rather large.

Style about 1 line long . . . . . 2. *U. flexuosa*.

Peduncles filiform, pedicels slender and erect in fruit. Corolla small.

Stigma almost sessile. Seeds winged . . . . . 3. *U. exoleta*.

Peduncles tubular, thickened. Flowers few or 2 whitish blue. Spur conical-subulate . . . . . 4. *U. tubulata*.

SECT. 2. **Limosa**.—Plants growing in mud (sometimes under water) with erect leafless scapes. Leaves radical, often accompanied by filaments of which some bear utricles or no leaves at all at the time of flowering.

Bracts not produced below their insertion, always alternate.

Flowers yellow or white, 1 or 2 on short filiform scapes.

Corolla (white) upper lip emarginate, lower shortly and broadly 3-lobed 5. *U. albiflora*.

Corolla (yellow?) upper lip entire, lower with 1 broad lobe and 2 lateral narrow ones . . . . . 6. *U. pygmæa*.

Flowers yellow, several in a raceme.

Pedicels very short, erect in fruit, not winged. Spur descending . . . 7. *U. chrysantha*.

Pedicels as long as the calyx, reflexed, and more or less winged in fruit. Spur descending . . . . . 8. *U. bifida*.

Flowers blue or white, several in a raceme. Pedicels short, not winged.

Calyx-segments rather acute . . . . . 9. *U. cyanea*.

Flowers small, purple. Calyx-segments very obtuse. Flowers distant, on very short pedicels. Scapes 1 to 4 in. . . . . 10. *U. lateriflora*.

Bracts produced below their insertion into a small free appendage. Flowers purple (or deep blue?).

Pedicels opposite, in 1, 2 or 3 pairs or in whorls of three. Corolla lower lip large, semicircular. Scapes erect, slender. Bracts opposite or in whorls of three. Spur shorter than the large semicircular lower lip.

Upper lip entire or shortly 2-lobed. . . . . 11. *U. dichotoma*.

Flowers racemose, alternate as well as the bracts. (Flowers blue?).

Pedicels as long as or longer than the calyx. Lower lip 2-lobed.

Flowers  $\frac{1}{2}$  in. long or more. Spur longer than the lower lip . . . 12. *U. biloba*.

Flower scarcely 2 lines long. Spur shorter than the lower lip . . . 13. *U. limosa*.

Pedicels scarcely any. Lower lip entire . . . . . 14. *U. Baueri*.

1. **U. stellaris** (whorl of vesicles star-like), *Linn. f.*; *A. DC. Prod.* viii. 3; *Benth. Fl. Austr.* iv. 525. Stems floating, branched, extending to a considerable length. Submerged leaves root-like, branching into numerous capillary segments interspersed with little globular vesicles. Peduncles slender, 2 to 4 in. long in the Australian specimens but longer in some Indian ones, bearing at some distance below the raceme a cluster or almost a whorl of 3 to 5 oblong or narrow vesicles each about  $\frac{1}{2}$  in. long, tapering at both ends, and bearing a few short simple or branched capillary segments. Flowers several, yellow, on pedicels of 2 to 6 lines, which are slender at the time of flowering, often thickened under the fruit, and then spreading or reflected. Calyx-segments ovate and about 1 line long in flower, broad and 2 lines diameter in fruit. Corolla upper lip ovate or rounded, obtuse, longer than the calyx, lower lip nearly orbicular, scarcely longer than the upper one, truncate or slightly 3-toothed; spur turned upwards under the lower lip and about its length. Capsule nearly as long as the calyx, membranous. Seeds peltate with an angular margin.—*Oliv. in Journ. Linn. Soc.* iii. 174; *F. v. M. Fragm.* vi. 161; *Wight, Ic.* t. 1567 (not good); *Roxb. Cor. Pl.* ii. 43, t. 180.

Hab.: Carron's Creek, *T. Gulliver*.

Common in tropical Asia, extending also into tropical Africa.

2. **U. flexuosa** (flexuose), *Vahl.*; *Oliv. in Journ. Linn. Soc.* iii. 175; *Benth. Fl. Austr.* iv. 525. Submerged floating stems extending sometimes to several feet. Leaves all submerged and root-like, branching into numerous capillary segments, interspersed with little globular vesicles or utricles. Peduncles usually 3 to 6 in. long, without vesicles, bearing a raceme of 3 to 6 yellow flowers. Pedicels erect and slender at the time of flowering, usually reflexed and thickened upwards when in fruit. Corolla fully 5 lines across, the upper lip

ovate, entire, or slightly emarginate, the lower nearly reniform, the palate marked with brown veins; spur obtuse, shorter than the lower lip. Style about 1 line long. Capsule nearly 3 lines diameter.—*U. fasciculata*, Roxb.; Wight, Ic. t. 1568; A. DC. Prod. viii, 7; *U. australis*, R. Br. Prod. 430; A. DC. Prod. viii, 6; Lehm. Pl. Preiss. i. 338; Hook. f. Fl. Tasm. i. 298; F. v. M. Fragm. vi. 161.

Hab.: Burnett and Brisbane Rivers, *F. v. Mueller*; Midge Creek and Burdekin River, *Bowman*; near Rockhampton, *O'Shanesy*.

Also in Asia and Malaya.

3. ***U. exoleta*** (exolete), *R. Br. Prod.* 430; *Benth. Fl. Austr.* iv. 526. Nearly allied to *U. flexuosa*, but very much smaller and more slender. Floating submerged stems capillary, with exceedingly fine filiform leaves, not much divided, interspersed with minute vesicles, the largest of which are scarcely  $\frac{1}{4}$  line diameter, and in marshy places the linear-filiform leaves are nearly entire. Scapes filiform, 1 to 3 in. long or rarely more, bearing 1, 2 or 3 small yellow flowers. Bracts very obtuse, not produced below their insertion. Pedicels slender and erect in fruit as well as in flower. Calyx-segments broad, very obtuse,  $\frac{1}{2}$  to  $\frac{3}{4}$  line long in flower, slightly enlarged under the fruit but not exceeding the capsule. Corolla not above three lines long to the end of the spur and sometimes scarcely 2 lines, the lips nearly equal, both broad; spur narrow-conical, obtuse, horizontal, or turned upwards, as long as or longer than the lower lip. Stigma sessile. Capsule membranous. Seeds peltate, bordered by a thin irregular wing.—A. DC. Prod. viii, 7; F. v. M. Fragm. vi. 162; *U. diantha*, Rœm. and Schult.; Oliv. in Journ. Linn. Soc. iii. 176, not of A. DC.; Wight, Ic. t. 1569.

Hab.: Gracemere, *Bowman*; near Rockhampton, *O'Shanesy*; and in many southern localities. The species has a wide range in tropical Asia.

4. ***U. tubulata*** (peduncles tubular), *F. v. M. Fragm.* ix. 48. Stems rather long, floating. Leaf-segments capillary-linear, about  $\frac{1}{2}$  in. long, vesicles oblique dimidiate globose, 1 to  $1\frac{1}{2}$  line long. Peduncles terminal, solitary, 2 to 6 in. long, inflated, and from 2 to 5 lines in diameter. Pedicels  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long. Sepals about  $1\frac{1}{2}$  line long, upper almost orbicular. Corolla whitish-blue. Capsule spherical, about 3 lines broad.

Hab.: Mountain swamps about Rockingham Bay.—*W. E. Armit*.

5. ***U. albiflora*** (flowers white), *R. Br. Prod.* 431; *Benth. Fl. Austr.* iv. 526. Scapes filiform,  $\frac{1}{2}$  to 1 in. long, bearing a single small white flower. Leaves none at the time of flowering. Bract minute, not produced at the base. Pedicel very short. Calyx-segments  $\frac{1}{2}$  line long at the time of flowering,  $\frac{3}{4}$  line when in fruit. Corolla not 2 lines long, the upper lip small, emarginate, lower lip broad, shortly 3-lobed; spur descending, as long as the lower lip.—A. DC. Prod. viii. 15.

Hab.: Endeavour River, *Banks and Solander*.

Perhaps a white-flowered variety of *U. pygmæa*, but both of these minute species require further investigation from better specimens.—*Benth.*

6. ***U. pygmæa*** (small) *R. Br. ? Prod.* 432; *Benth. Fl. Austr.* iv. 526. Scapes filiform, 1 to 3 in. high. Leaves radical, narrow-linear or none. Flowers small, yellow, solitary, or 2 distant ones on rather long filiform pedicels. Bracts obtuse, not produced at the base. Calyx-segments obtuse, about 1 line long. Corolla: upper lip not twice as long as the calyx, obovate or orbicular, entire;



lower lip larger, the middle lobe convex, fully 2 lines across, the lateral lobes linear, divaricate; spur ascending, as the lower lip. Capsule membranous, the fruiting pedicel not reflexed.—A. DC. Prod. viii. 16.

Hab.: Cape Grafton, *Banks and Solander*; Brisbane River, *W. Hill*.

The Banksian specimens are minute, and the colour of the flower is not given; their identity with Hill's yellow-flowered specimens (determined by F. v. Mueller) is therefore in some measure uncertain.—*Benth.*

7. **U. chrysantha** (golden-flowers), *R. Br. Prod.* 432; *Benth. Fl. Austr.* iv. 527. Scapes slender but tall, often exceeding 1ft. Leaves usually none at the time of flowering. Flowers yellow, usually numerous but distant, rarely forming a more compact spike. Pedicels exceedingly short, erect in fruit and then not exceeding 1 line. Bracts very small, usually acute, not produced at the base. Calyx-segments ovate-lanceolate, about 1 line long. Corolla: upper lip much longer than the calyx, ovate-orbicular, entire; lower lip rather longer, broad, very convex, the margins reflexed and 4-lobed (3-lobed with the middle lobe 2-fid); spur descending, straight or slightly curved, as long as the upper lip, the whole corolla usually about  $\frac{1}{2}$  in. long. Capsule globular, almost crustaceous, about 1 line diameter. Seeds minute.—A. DC. Prod. viii. 18.

Hab.: Point Lookout, *Banks and Solander*; Rockingham Bay, *Dallachy*; Gilbert and Norman Rivers, *T. Gulliver*.

*U. flava*, *R. Br. Prod.* 432; *A. DC. Prod.* viii. 18, from Endeavour River, *Banks and Solander*, appears to me to be a slender variety of *U. chrysantha*, with the middle lobe of the lower lip nearly entire.—*Benth.*

8. **U. bifida** (2-cleft), *Lam.; Oliv. in Journ. Linn. Soc.* iii. 182; *Benth. Fl. Austr.* iv. 527. Scapes slender, usually about 6in. high. Radical leaves small, linear or spatulate, very rare at the time of flowering. Flowers yellow, usually from 6 to 8 on the scape, rather distant. Pedicels 1 to 2 lines long, reflexed when in fruit and winged by the decurrent calyx-segments. Bracts acute, not produced at the base. Calyx-segments orbicular, obtuse, scarcely above 1 line long in flower, twice as large and decurrent when in fruit. Corolla: upper lip obovate, longer than the calyx, the lower lip broad, convex, longer than the upper one; spur conical, descending as long as the upper lip. Capsule membranous. Seeds small, ovoid, reticulate.—*U. diantha*, *A. DC. Prod.* viii. 21, not of Røem. and Schult.

Hab.: Rockingham Bay, *Dallachy*.

Extends over tropical Asia.

9. **U. cyanea** (blue), *R. Br. Prod.* 431; *Benth. Fl. Austr.* iv. 527. Scapes slender, rarely exceeding 6in. Leaves radical, linear or slightly spatulate,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, or sometimes very narrow and more than twice that length, but usually disappearing before the flowering. Flowers blue, sometimes very pale or white, several on the scape but distant. Pedicels shorter than or scarcely exceeding the calyx, ascending or erect in fruit and not at all or scarcely winged. Bracts acute or acuminate, not produced at the base. Calyx-segments about 2 lines long when in flower and scarcely enlarged when in fruit, acute or scarcely obtuse. Corolla: upper lip shorter than the calyx or scarcely exceeding it, obovate; lower lip rather longer, broader and very convex; spur descending, conical, rather obtuse, as long as the lower lip. Capsule membranous. Seeds nearly globular, appearing tuberculate or almost muricate when dry, reticulate only when soaked.—*A. DC. Prod.* viii. 15; *U. graminifolia*, *R. Br. Prod.* 432, but scarcely of Vahl.

Hab.: Endeavour River, *Banks and Solander*; Brisbane River, *F. v. Mueller* (with leaves 1in. long).

Var. *alba*. Corolla white, the calyx not quite so large in proportion at the time of flowering.—Rockingham Bay, *Dallachy*; Islands of Moreton Bay.

*U. affinis*, Wight, Ic. t. 1580; Oliv. in Journ. Linn. Soc. iii. 178, from the Indian Peninsula, appears to be as suggested by Oliver, the same plant, differing from the common Asiatic *U. cærulea*, Linn. (which is probably the true *U. graminifolia*, Vahl.) in the shorter pedicels, usually less acute calyxes, and perhaps a few other characters of no great importance.—*Benth.*

10. ***U. lateriflora*** (flowers lateral), *R. Br. Prod.* 431; *Benth. Fl. Austr.* iv. 528. Scapes slender, sometimes filiform, but often rather rigid and drying black, 1 to 4 in. high. Leaves radical, spatulate, very rarely present at the time of flowering. Flowers small, purple, usually only 2 to 4, distant and very shortly pedicellate or almost sessile. Bracts obtuse, not produced at the base. Calyx not 1 line long. Corolla: upper lip oblong or linear, truncate or emarginate, shortly exceeding the calyx; lower lip broader than long, 3 to 4 lines across, entire or obscurely crenate, the sides reflexed; spur conical, nearly as long as the lower lip or sometimes rather longer. Capsule membranous. Seeds small, ovoid.—*A. DC. Prod.* viii. 15; *Hook. f. Fl. Tasm.* i. 299.

Hab.: Islands of Moreton Bay.

*U. parviflora*, *R. Br. Prod.* 431; *A. DC. Prod.* viii. 15, appears to me to be a slight variety of *U. lateriflora*, with long filiform scapes and rather smaller flowers.—*Benth.*

11. ***U. dichotoma*** (dichotomous), *Labill. Pl. Nov. Holl.* i. 11. t. 8; *Benth. Fl. Austr.* iv. 529. Scapes slender, from a few inches to above 1 ft. high. Leaves radical, petiolate, from almost ovate and 1 line long to linear or oblong, 3 to 4 lines long (or in a few abnormal specimens more than 1 in. and very narrow), accompanied by filiform fibres, some of them bearing small fringed utricles, the leaves sometimes disappearing before the flowering. Flowers purple or lilac, opposite in 1 or 2 pairs or whorls of 3 at the end of the stem, rarely reduced to a single terminal flower. Pedicels filiform, at first very short but lengthening from  $\frac{1}{4}$  to  $\frac{1}{2}$  in. under the fruit. Bracts always opposite or in threes (even when the flower is solitary), small and narrow, very shortly produced below their insertion. Calyx-segments usually about  $1\frac{1}{2}$  line long, broad and obtuse. Corolla: upper lip small, broadly ovate or obovate, obtuse or obscurely 2-lobed; lower lip horizontal, broadly semicircular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. across, the palate with a small 3-lobed prominence; spur descending, obtuse, much shorter than the lower lip and sometimes very short. Capsule membranous. Seeds small, ovoid.—*A. DC. Prod.* viii. 14; *Hook. f. Fl. Tasm.* i. 299; *F. v. M. Fragm.* vi. 161; *U. speciosa*, *R. Br. Prod.* 430; *U. oppositiflora*, *R. Br. lc.*; *A. DC. Prod.* viii. 14.

Hab.: Many of the southern swamps; Cupravale. *Rev. B. Seortechini.*

Var. *uniiflora*. Flowers smaller, mostly solitary.—*U. uniiflora*, *R. Br. Prod.* 431; *A. DC. Prod.* viii. 14; *Hook. f. Fl. Tasm.* i. 299. Generally mixed with the 2 or more-flowered specimens. The specimens distinguished by Brown as his three species appear to me to differ only in the number and size of the flowers, which are always variable in all the sets of *U. dichotoma* which I have seen.—*Benth.*

12. ***U. biloba*** (2-lobed), *R. Br. Prod.* 432; *Benth. Fl. Austr.* iv. 531. Scapes slender, simple or slightly branched, 6 to 9 in. high, usually with several small scales, which as well as the bracts are alternate and produced below their insertion, mostly acute. Leaves very small and rare at the time of flowering. Flowers blue (*R. Brown*), dark when dry, several in a raceme, on filiform pedicels usually as long as or rather longer than the calyx. Calyx-segments about 1 line long when in flower and but slightly enlarged afterwards, very broad and obtuse. Corolla: upper lip very short, ovate, 2-lobed, with the sides reflexed; lower lip broader than long, broadly 2-lobed; spur conical, obtuse, horizontal or descending, longer than the lower lip, the whole corolla 3 or 4 lines long.—*A. DC. Prod.* viii. 21.

Hab.: Southern swamps.

This and the following two species usually turn black in drying, which is not the case with *U. cyncea*. *U. lateriflora* sometimes turns black, but it is readily distinguished by the bracts.—*Benth.*

13. **U. limosa** (found in mud), *R. Br. Prod.* 432; *Benth. Fl. Austr.* iv. 531. Scapes filiform, simple or branched, 6 to 10 in. high. Leaves none at the time of flowering. Flowers (blue?) in a long loose raceme, all alternate. Bracts narrow, much produced below their insertion, acute at both ends. Pedicels filiform, 1 to 2 lines long. Calyx-segments orbicular, obtuse, about  $\frac{1}{2}$  line long when in flower, slightly enlarged afterwards. Corolla scarcely above 2 lines long, the upper lip short, ovate, entire; lower lip much larger, broad, deeply 2-lobed; spur descending, shorter than the lower lip. Capsule small.—A. DC. *Prod.* viii. 24.

Hab.: Endeavour River, *Banks and Solander*.

Very near *U. biloba*, but very much more slender, the flowers much smaller, the pedicels longer, and the spur shorter.—*Benth.*

14. **U. Baueri** (after F. Bauer), *R. Br.' Prod.* 431; *Benth. Fl. Austr.* iv. 531. Scapes slender but rather long, simple or slightly branched, more rigid than in *U. biloba*, bearing usually several scales below the inflorescences, which, like the bracts are all alternate, narrow, produced below their insertion, acuminate and very acute at both ends. Flowers (blue?) almost sessile in short terminal spikes, with rarely the lower flower at some distance below the spike. Calyx-segments obtuse, small. Corolla: upper lip short, narrow-ovate, erect, entire; lower lip much larger (about 3 lines across), broader than long, apparently quite entire with the sides reflexed; spur straight, horizontal, considerably longer than the lower lip.—A. DC. *Prod.* viii. 15.

Hab.: Endeavour River, *Banks*; Shoalwater Bay, *R. Brown*.

*U. Baueri* was described by Brown from a drawing made by Bauer of a plant of which no specimen was preserved; but in his notes he says he believes it to be the same as one of which he had a specimen before him, which there is now no certain means of identifying. The character, however, agrees well with the specimens described above, which are named by Solander in the Banksian herbarium *U. juncea*, and with one in Brown's own herbarium labelled *U. obscura*, neither of which names are taken up by Brown.—*Benth.*

## ORDER LXXXIX. OROBANCHACEÆ.

Flowers irregular. Sepals 4 or 5, united in a variously split calyx. Corolla tubular or campanulate, usually curved or oblique; the limb more or less 2-lipped; the upper lip erect or spreading, emarginate or 2-lobed; the lower lip spreading, 3-lobed. Stamens 4, in pairs, inserted in the tube. Anthers 2-celled, the cells usually but not always pointed or awned, opening longitudinally. Ovary superior, 1-celled, with 2 (very rarely 3) double or bifid placentas, or 4 distinct placentas, more or less protruding from the sides into the cavity, but not united into the axis. Ovules several, usually very numerous. Style simple, with a capitate or 2-lobed stigma. Capsule 2-valved. Seeds small, with a minute embryo and abundant albumen.—Leafless herbs, not green, parasites on roots. Stems usually thick, the leaves replaced by alternate scales or bracts of the colour of the rest of the plant. Flowers solitary in the axils of the bracts, usually forming terminal spikes or racemes.

An Order not very numerous in species, but widely distributed over nearly the whole globe, except the extreme north and south, and much more abundant in the northern than in the southern hemisphere. The only Australian genus is the principal one of the Order, though almost limited to the northern hemisphere.—*Benth.*

## 1. OROBANCHE, Linn.

(Supposed derived from *Orobos*, Vetch; and *ancho*, to strangle; supposed to kill the plants on which they grow.)

Calyx divided to the base on the upper side, and often also on the lower side, so as to form 2 lateral sepals, either entire or 2-cleft, either distinct from each other or more or less connected at the base on the lower side, and sometimes connected also on the upper side by the intervention of a small fifth lobe, and always pointed. Habit and other characters those of the Order.

The principal genus of the Order, abundant in the northern hemisphere in the Old World, less so in North America, and a very few of the European species have also appeared in the southern hemisphere, and amongst them the only Australian one.—*Benth.*

1. **O. cernua** (drooping), *Lapl.; Reut. in DC. Prod.* xi. 32; *Benth. Fl. Austr.* iv. 533. Stems stout, erect, simple, from about 6in. to above 1ft. high, of a pale-brown color more or less tinged with blue and loosely pubescent; the scales ovate, the lower ones ovate, the upper ones acute or acuminate. Flowers of a lurid bluish-purple, pale or whitish towards the base, in a rather dense spike, occupying about one-third of the stem. Bracts acuminate, acute, shorter than the corolla. Sepals in the Australian specimens 2, entire, lanceolate, with long points, nearly as long as the bracts. Corolla tubular, incurved, about  $\frac{3}{4}$ in. long, glabrous or minutely glandular-pubescent towards the top; upper lip very concave, with two short broad lobes, not ciliate; lower lip divided into 3 ovate shortly acuminate spreading lobes. Filaments glabrous; anthers not mucronate. Style glabrous, with short very thick stigmatic lobes.

Hab: Some years ago my attention was drawn to a plant of this species which was flowering in the garden at "Coira," the residence of Col. Lyster, Kelvin Grove.

The species is an inhabitant of the Mediterranean region of the northern hemisphere, where it is found on several species of *Artemisia*, and extends to E. India.

## ORDER XC. GESNERIACEÆ.

(Cyrtrandraceæ, *DC. Prod.*)

Flowers usually irregular. Calyx with 5 teeth lobes or distinct sepals. Corolla with a long or short tube, the limb 2-lipped or of 5 spreading lobes, imbricate in the bud. Stamens 2 or 4, in pairs, inserted in the tube, with the addition sometimes of a fifth barren one or staminodium. Anthers 2-celled or 1-celled by the confluence of the two, the cells opening longitudinally. Ovary superior or more or less inferior, 1-celled, with 2 parietal entire or lobed placentas, protruding more or less into the cavity, but not united in the axis. Ovules numerous. Style simple, with an entire or lobed stigma. Fruit a berry or capsule. Seeds small, numerous, with or without albumen. Embryo straight.—Herbs or rarely shrubs or climbers. Leaves opposite or whorled.

A considerable Order, chiefly tropical, with a very few species from more temperate climates. The Order differs from *Scrophularinæ* and *Bignoniaceæ* chiefly in the parietal placentation of the ovary.

TRIBE I. **Cyrtandrea**.—The ordinal character above given is narrowed to the species of this tribe.

SUBTRIBE I. **Didymocarpeæ**.—Capsule loculicidally 2-valved, often ultimately 4-valved, placentas deeply intruded nearly meeting, not seed-bearing on their inner faces. Seeds without hairs.

Stigma oblique, emarginate. Stamens 2, perfect. Capsule frequently sub-follicleular . . . . . 1. DIDYMOCARPUS.  
Capsule having the valves spirally twisted before dehiscing. Corolla-lobes 5, subsimilar, round . . . . . 2. BÆA.

SUBTRIBE II. **Eucyrtandrea**.—Berry indehiscent, succulent or membranous, breaking up irregularly. Seeds without hairs.

Undershrubs. Corolla tubular. Stamens 2 perfect . . . . . 3. CYRTANDRA.





*Bacca hygroscopica*, FvM.

Govt. PRINTING OFFICE, BRISBANE.

## 1. DIDYMOCARPUS, Wall.

(Twin-fruited).

Calyx tubular or campanulate, 5-toothed, 5-fid, or 5-partite, the segments narrow. Corolla-tube elongate widening upwards, or short, broad and ventricose; limb spreading, somewhat 2-lipped, the upper lip 2-lobed, the lower 3-lobed, the lobes broad, slightly unequal. Stamens 2 lower, rarely 4 perfect, inserted at the base or middle of the tube or rarely higher, included; filaments arched or flexuose. Anthers connivent or coherent; cells divergent or divaricate, confluent at the point. Disk cupulate, surrounding the ovary or wanting. Ovary free, oblong-linear, imperfectly 4-celled. Style short or elongated, stigma slightly dilated, somewhat entire; ovules densely covering the margins of the placenta. Capsule linear, 2-valved, valves entire. Seeds small, foveolate. Herbs rarely undershrubs, of various habit. Leaves radical, opposite, or rarely alternate. Peduncles or scapes axillary, bearing a loose cyme of few flowers.

The species are met with in India, Malaya, South China, and Madagascar, besides Australia.

1. **D. Kinnearii** (after Robert Kinnear), *F. v. M.*, Vict. Nat., Mar. 1887. Stemless. Leaves lanceolate or cordate-ovate, almost membranous, conspicuously serrated, the upper surface sprinkled with septate hairs, the under surface as well as the long petioles silky-hairy. Peduncles about the height of the leaves, bearing a spreading softly hairy cyme of many small flowers; pedicels capillary, elongated, often in umbels. Bracts narrow. Calyx about half the length of the corolla; segments broad-linear, narrowed upwards. Corolla white, glabrous, upper lobes deeply divided, the middle one of the lower lobes somewhat longer than the others, the tube slightly widened, not quite as long as the lobes. Stamens 2, as well as the style and ovary glabrous. Capsule hardly three times as long as the calyx, about twice the length of the style, narrow, ellipsoid-cylindrical, attenuated towards the summit, not stipitate; placentas amply intruding. Seeds almost spindle-shaped.

Hab.: Collected by *Sayer and Davidson* near the summit of one of the mountains of the Bellenden Ker Range.

## 2. BÆA, Commers.

(After Rev. Dr. Beau, of Toulon.)

Calyx divided to the base into 5 segments. Corolla with a short broadly campanulate tube, the limb somewhat 2-lipped, the upper lip 2-lobed, the lower 3-lobed, the lobes all flat and spreading. Stamens 2, shorter than the corolla; anther-cells diverging or divaricate, confluent at the apex into a single cell; staminodia usually 3, very small. Stigma 2-lobed. Capsule linear, spirally twisted, splitting usually into 4 valves. Seeds minute.—Herbs with a perennial stock and radical leaves, or in species not Australian a developed stem and opposite leaves. Peduncles or scapes axillary, bearing usually a dichotomous or umbellately branched panicle of flowers, without bracteoles.

The genus comprises a very few Asiatic species, one of them extratropical, and one from the Seychelles Islands. The only Australian one is endemic.—*Benth.*

1. **B. hygroscopica** (found near water), *F. v. M. Fragm.* iv. 146; *Benth. Fl. Austr.* iv. 532. A perennial with a short thick woolly stock. Leaves radical, rosulate, broadly ovate or orbicular, crenate, sessile or contracted into a short broad petiole, thick soft and rugose, densely clothed with long woolly hairs, the larger ones 4 to 5 in. long, but usually half that size. Scapes 4 to 8 in. high, bearing a loose umbellately branched panicle of rather numerous deep-blue flowers, the inflorescence glabrous or sprinkled with a few hairs. Bracts few and minute. Calyx-segments linear-oblong, about  $1\frac{1}{2}$  line long. Corolla-tube broad

and not above 1 line long, upper lip of 2 orbicular lobes 2 or more lines diameter, lobes of the lower lip smaller. Filaments thickly clavate, longer than the anthers; anther-cells quite divaricate, forming a single narrow-oblong cell. Stigma of 2 short broad lobes. Capsule from  $\frac{3}{4}$  to above 1 in. long.

Hab.: Common on wet rocks in tropical localities.

At first sight closely resembles the N. Chinese *B. hygrometrica*, Br. (*Dorcoceras*, Bunge), which has the same foliage, but the scape in the Chinese plant is less divided, the corolla-tube much larger (that figured in Deless. Ic. v. t. 95, is an imperfectly developed bud), and the anthers reniform on short filaments.—*Benth*,

### 3. CYRTANDRA, Forst.

(From *kyrtos*, a curve, and *andros*, a male.)

Calyx free, tubular, ovoid-campanulate or roundly expanded, 5-fid or 5-partite. Corolla-tube cylindrical or funnel-shaped, 2-lipped, deciduous or persistent; teeth 5. Stamens, 2 perfect, 2 or 3 rudimentary, included or shortly exerted; filaments arcuate, anthers connivent or coherent, cells parallel or divergent. Disk annular or cupulate. Ovary superior, ovoid or oblong; style long or short; stigma dilated, concave, or more or less distinctly 2-lipped. Fruit fleshy, indehiscent, globose, ovoid-oblong or linear. Seeds very numerous, minute, usually dotted. Small or large shrubs or trees, villous or glabrous. Leaves opposite equal or unequal, or one of each pair rudimentary or wanting. Flowers usually white or yellow, in axillary fascicles, capitate or cymose. Bracts small or the exterior ones large, distinct, or connate in an involucre.

Species numerous; Polynesian, Malayan, &c.

1. **C. Baileyi** (after F. M. Bailey), *F. v. M.*, 3rd Suppl. Syn. Ql. Fl. 51. A soft-wooded shrub of about 8 ft. in height. Branchlets when young somewhat beset with brown interwoven hairlets. Leaves alternate, rather large, attaining 8 in. in length, the opposite rudiments about  $\frac{1}{4}$  in. long, short stalked, thinly chartaceous, from ovate to elongate-lanceolate at the base almost cuneate but inequilateral, on both sides dull-green though pale beneath, nearly glabrous, narrow or short-acuminated, towards the upper end undular-denticulated, their primary lateral veinlets slightly prominent, the ultimate venules concealed, the opposite rudiment bract or stipule-like, about as long as the leafstalk or shorter, semilanceolate-linear, pointed. Flowers nearly white, singly, opposite to a leaf, glabrous. Pedicels thin, scarcely as long as the calyx or at times longer, say about  $\frac{1}{3}$  in. long. Calyx lobes about half the length of the tube, the lower deltoid, the upper much united and minutely apiculate. Corolla rather more than double as long as the calyx. Stamens: fertile inserted near the middle of the corolla; sterile placed somewhat lower down. Anthers (fertile) almost narrow-ellipsoid, disk short and blunt-lobed. Style glabrous, about half as long as the corolla. Stigma dilated, somewhat truncated; ovulary narrow-pointed, glabrous. Fruit oblique-ellipsoid, about  $\frac{3}{4}$  in. long. Seeds very numerous, narrow-ellipsoid, almost smooth, dark-brown outside.

Hab.: Russell River, *Bellenden Ker Exped.* Specimens with flower. Fruit specimens, W. Sayer, at about 5,000 ft. altitude, Bellenden Ker, according to Baron Mueller, to whom I am indebted for the above description; but as Mr. Sayer was not on Bellenden Ker, but on a mountain called by the natives Chickaboogalla, the altitude of which is about 3,970 ft., he probably gathered his specimens near the locality where I got my flowering shoots. The shrub was not abundant and I only secured three or four specimens.

Systematically this species could best be placed near *C. trispala*, as that congener has also alternate leaves; but the flowers of that plant are usually placed in twos and threes, leaf-opposed; the calyxes are split and the style is not glabrous.—*F. v. M. l.c.*



## ORDER XCI. BIGNONIACEÆ.

Flowers irregular. Calyx tubular or campanulate, truncate toothed or laterally split. Corolla-tube elongated or rarely short and campanulate; lobes 5, spreading, often arranged in 2 lips, variously imbricate or rarely induplicate-valvate in the bud. Stamens 2 or 4, in pairs, inserted in the tube, the fifth staminodium usually small, rarely wanting. Anthers 2-celled, the cells opening longitudinally. Ovary usually 2-celled, with 2 distinct placentas in each cell attached to the dissepiments, and either contiguous or separated by a considerable interval, or, in some genera not Australian, the dissepiment discontinued between the placentas, and the ovary then 1-celled; ovules several, often numerous to each placenta. Style filiform, with 2 short stigmatic lobes. Fruit a capsule, often elongated, opening loculicidally or septifragally in 2 valves, leaving the dissepiment free. Seeds transverse, usually flattened and bordered by a membranous wing, without albumen. Embryo straight or rarely curved; cotyledons flat or fleshy; radicle next to hilum.—Trees shrubs or woody climbers, very rarely (in species not Australian) herbs. Leaves opposite or rarely scattered, compound or rarely simple, without stipules. Flowers solitary in the axils or more frequently paniculate.

An Order almost entirely tropical, and most abundant in South America.

TRIBE I. **Tecomeæ**.—Ovary 2-celled. Capsule loculicidal, 2-valved.

Stamens included in the corolla-tube.

Calyx truncate or slightly toothed. Woody climbers . . . . . 1. **TECOMA**.

Calyx spathaceous, split longitudinally. Erect trees . . . . . 2. **DOLICHANDRONE**.

Stamens exserted, longer than the corolla.

Corolla-tube elongated; lobes induplicate-valvate. Woody climber, with compound leaves . . . . . 3. **HAUSSMANNIA**.

Corolla-tube campanulate; lobes imbricate. Erect tree, with simple whorled leaves . . . . . 4. **DIPLANTHERA**.

1. **TECOMA**, Juss.

(From the Mexican name *Tecoma rockii*.)

Calyx truncate or shortly 5-toothed. Corolla tubular, the lobes spreading, nearly equal, obscurely 2-lipped or oblique. Stamens 4, in pairs, included in the tube; anther cells diverging or divaricate. Style with 2 short ovate stigmatic lobes. Ovules numerous, in several rows on each placenta. Capsule (oblong in the Australian species) opening loculicidally in 2 very concave valves, the dissepiment transverse with relation to the valves, and not laterally dilated. Seeds overlaying each other in several rows, flat, broadly winged.—Tall woody climbers. Leaves opposite, pinnate. Flowers in terminal panicles. Bracts minute; bracteoles none.

Species mostly American. The four Australian ones are endemic.

Panicle corymbose. Corolla about 3in. long, limb reddish, tube pale . . . . . 1. *T. Hillii*.

Panicles loose. Corolla-tube about 1in. long, the lobes sometimes less than half as long . . . . . 2. *T. australis*.

Panicles compact, corymbose. Corolla-tube above 1in., the lobes more than half as long . . . . . 3. *T. jasminoides*.

Leaves attaining the length of 2ft., opposite or in whorls of 3 or 4. Flower panicles 3 to 15in. long . . . . . 4. *T. Baileyana*.

1. **T. Hillii** (After Walter Hill, late Col. Botanist) *F. r. M. Fragm.* x. 101 and xi. 136. A tall, glabrous climber. Leaves pinnate; leaflets 5, ovate-lanceolate, 1 to 3in. long, thin. Corymbs of about 6 flowers. Calyx  $\frac{1}{2}$  to 1in. long, membranous. Corolla 2 to 3in. long, limb rosy-purplish, the tubes pale, marked with purplish lines, the lobes 3 to 4 lines long pubescent towards

the margins. Filaments filiform, anthers yellow, cells equal,  $1\frac{1}{2}$  to 2 lines long, widely divergent. Staminodium 2 to 3 lines long. Style filiform, glabrous, stigmatic lobes semilanceolate. Capsule  $1\frac{1}{2}$  in. long.

Hab.: The only plant ever met with in a wild state was the one found by Mr. Fred. Turner at Hervey Bay in 1876, when collecting in that locality for Mr. W. Hill.

2. **T. australis** (Australian), *R. Br. Prod.* 471; *Benth Fl. Austr.* iv. 537. A tall woody glabrous climber, with more or less twining branches. Leaflets usually 5 to 9, ovate-oblong ovate-lanceolate or almost linear, entire, or here and there coarsely crenate, from under 1 in. to nearly 3 in. long, but exceedingly variable, all small or all large, sometimes, especially on barren shoots, all coarsely toothed, and then occasionally all very small and much more numerous. Flowers of a yellowish-white, tinged inside with purple or red, in loose terminal panicles, leafy at the base, the primary and often the secondary branches opposite, the ultimate inflorescence cymose or racemose. Calyx smooth, 1 to  $1\frac{1}{2}$  line long. Corolla-tube from about  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, slightly curved and dilated upwards; lobes broad, not one-third as long as the tube, the 2 upper rather smaller with purple or red spots or streaks at their base, the throat bearded inside under the lower lip. Capsule  $1\frac{1}{2}$  to 3 in. long, usually acute at both ends, the valves hard and very concave. Seeds very flat, obovate, surrounded by a broad wing.—*DC. Prod.* ix. 225; Maund, *Botanist*, t. 8; *T. Orleyi* and *T. floribunda*, A. Cunn. in *DC. Prod.* ix. 225; *T. diversifolia*, G. Don, *Gen. Syst.* iv. 224; *DC. Prod.* ix. 225; *T. ochroantha*, Kunth and Bouché, *Ind. Sem. Hort. Berol.* 1847, 12 (according to the character given and Seeman's verification.—*Benth.*)

For the convenience of Queensland botanists the three forms are given as named varieties.

Var. *Pandorea*. Leaflets on the flowering shoots usually 3, the lateral ones more or less oblique at the base, smaller than the terminal one which is from 2 to 3 in. long, base broadly rounded, from whence narrowed to a long acuminate sharp point; terminal petioles long, the lateral ones short. The terminal panicle often wide spreading. Flowers 1 in. or more long expanding upwards to nearly  $\frac{3}{4}$  in. wide, emitting a strong disagreeable odour. Capsule dark-brown, the largest about  $\frac{3}{4}$  in. long, valves stiff.—No. 11, *Fl. Pl. and Ferns N.S.W.*, Maiden and Campbell; *Bignoniæ Pandorea*, Vent. *Jard. Malm.*, t. 43; *Bot. Mag.*, t. 865.

Var. *meoantha*. Leaflets on the flowering shoots 3 or 5, usually oblong, mucronate. Panicles usually narrow. Flowers fragrant, seldom exceeding  $\frac{3}{4}$  in. in length, narrow. Capsule the largest about  $2\frac{1}{2}$  in. long, valves rather thin.—*T. meoantha*, G. Don, *Gen. Syst.* iv. 224; *Bignoniæ meoantha*, Link. *Enum. Hort. Berol.* ii. 130.

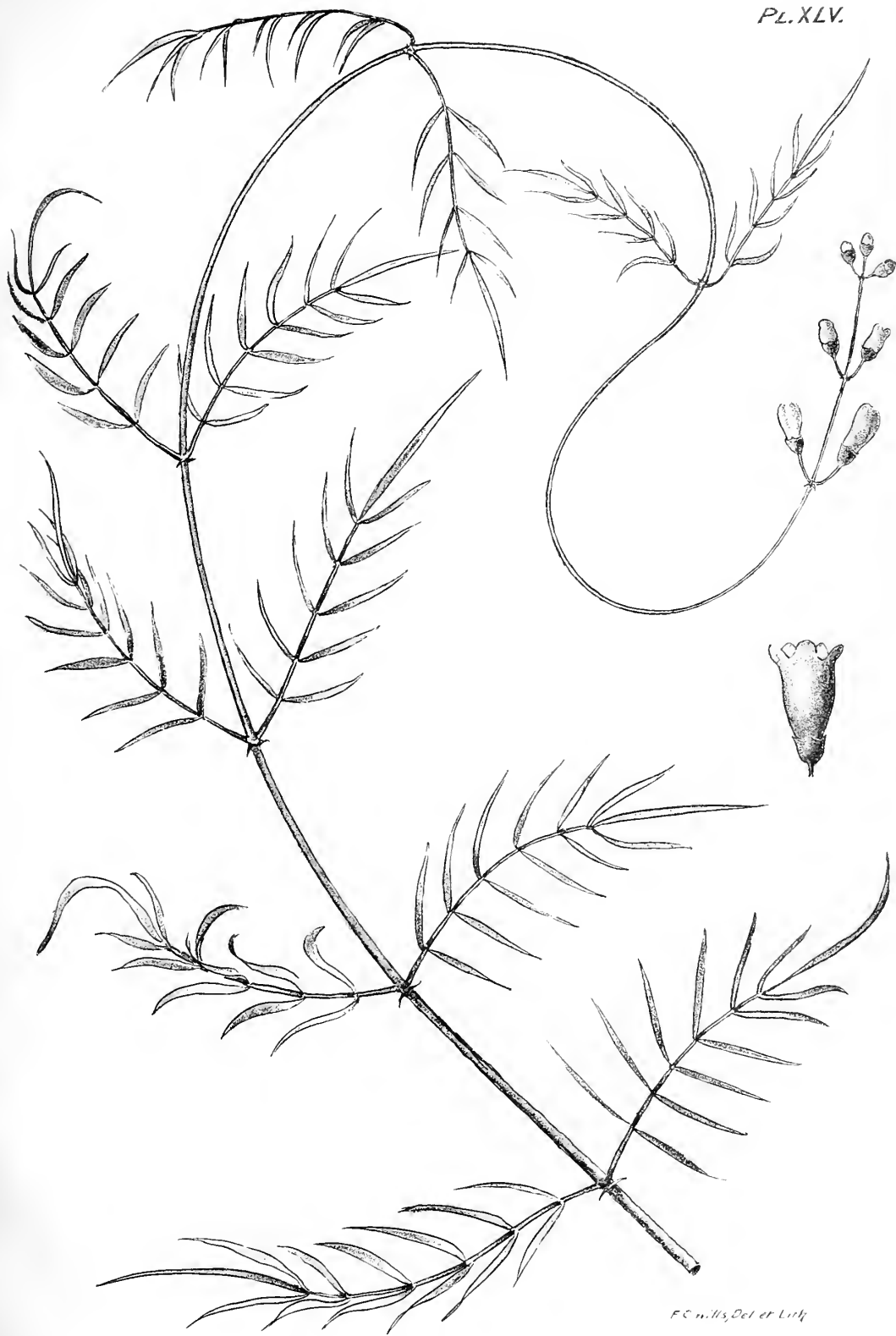
Var. *linearis*. Leaves of from 4 to 6 pairs and a terminal leaflet, this one the largest, 1 to 2 in. long and seldom exceeding 2 lines broad, the lateral ones scarcely half the size of the terminal one. Panicles on long peduncles. Flowers few about the size and form of *v. meoantha*. No capsules seen.—Herberton, *J. F. Bailey*.

3. **T. jasminoides** (Jasmine-like), *Lindl. Bot. Reg.* t. 2002; *Benth. Fl. Austr.* iv. 537. A tall glabrous woody climber. Leaflets usually 5 or 7, ovate and acuminate or ovate-lanceolate, 1 to 2 in. long, all entire, not presenting the remarkable variations of *T. australis*. Flowers white, streaked with red in the throat, in compact terminal corymbose panicles. Calyx smooth, fully 3 lines long. Corolla tube above 1 in. long, much more dilated upwards than in *T. australis*, the lobes very broad, more than half as long as the tube, the throat scarcely bearded inside or marked with 2 decurrent lines of short hairs. Capsule similar but larger than *T. australis*, the seeds rather broader, almost orbiculate, the wing either entirely surrounding them or chiefly on the two sides.—*DC. Prod.* ix. 225; *Bot. Mag.* t. 4004.

Hab.: Brisbane River, Moreton Bay, A. Cunningham, *F. v. Mueller*; Ipswich, *Nerust*.

The leaflets are often infested with the blight-fungus, *Melasmia tecomatis*, C. & M.

4. **T. Baileyana** (After F. M. Bailey), *J. H. Maid. and R. T. Bak. Proc. Linn. Soc. N.S.W. Sec. Ser.* x. 592. *Pl.* li. A tall woody glabrous climber. Leaves pinnate with 7 to 9 leaflets, sometimes exceeding 2 ft., opposite or in



F.C. Willis, Del. et Lith.

*Tecoma australis* v. *linearis*.

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whorls of 3 or 4, petioles 3in. long. Leaflets oblique, usually 7, about 5in. long and over 2in. broad, ovate, acuminate, rounded at the base or slightly tapering into a very short petiole, pale and prominently reticulate on the underside; margins slightly recurved. Flowers in axillary racemes or interrupted spikes (the plate shows a panicle) 3 to 15in. long; cream coloured, the lobes and throat shaded with pink. Calyx glabrous, 5-toothed, purplish-brown. Corolla-tube incurved, 6 lines long, cylindric, covered on both sides with minute glandular hairs or processes very numerous on the lobes; lobes short, almost equal. Stamens 4, in pairs, included. Style exceeding the stamens, stigmatic lobes short.—*J. H. M. and R.T.B. l.c.*

Hab.: Near the Tweed River, *W. Bauerlen*. Until fruit is known the genus is doubtful.

## 2. DOLICHANDRONE, Fenzl.

(*Spathodea*, *Beauv.*)

Calyx spathaceous, herbaceous, acuminate, oblique, split on the upper edge. Corolla tubular, the lobes spreading, nearly equal, obscurely 2-lipped or oblique, imbricate in the bud. Stamens 4, in pairs, included in the tube, with a small fifth staminodium; anther cells parallel. Ovules crowded on the placentas but almost in a single row. Capsule linear, elongated, flattened or nearly terete, opening loculicidally in 2 concave or nearly flat valves, the dissepiment transverse with relation to the valves, but so much laterally dilated between the placentas as to appear flattened and parallel to the valves. Seeds in a single row to each placenta, flat, broadly winged on each side, but scarcely overlapping each other.—Small trees. Leaves scattered or irregularly whorled, entire or pinnate. Flowers in terminal racemes. Bracts minute; bracteoles none.

Leaves ovate, simple, mostly scattered . . . . . 1. *D. alternifolia*.  
Leaves simple or pinnate, mostly whorled, lanceolate or linear as well as  
their leaflets . . . . . 2. *D. heterophylla*

1. ***D. alternifolia*** (leaves alternate), *Benth. and Hook. Gen. Pl.* ii.; *Benth. Fl. Austr.* iv. 538, as *Spathodea alternifolia*, *R. Br. Prod.* 472. A tree evidently allied to *D. heterophylla*, and a variety only according to Seeman, but the few specimens known insufficient for determining the point. Leaves scattered, alternate or irregularly opposite, simple, ovate or broadly ovate-lanceolate, acuminate, very coriaceous, obliquely veined, narrowed into a long petiole, no pinnate ones occurring on any of the specimens known. Flowers unknown. Capsule as in *D. heterophylla*.—*DC. Prod.* ix. 209.

Hab.: Endeavour River, *Banks and Solander*; Burdekin River, *F. v. Mueller*.

2. ***D. heterophylla*** (various-leaved), *F. v. M. Fragm.* iv. 149; *Benth. Fl. Austr.* iv. 538, as *Spathodea heterophylla*, *R. Br. Prod.* 472. A scrubby tree of 10 to 15ft., with a rugged bark, quite glabrous. Leaves crowded on the young shoots, mostly in whorls of 3, simple or pinnate with 3 to 7 leaflets, varying from oblong-lanceolate to linear, from 1 to 3in. long, the simple leaves usually lanceolate, from 1½ to 5in. long and narrowed into the petiole without articulation, both leaves and leaflets thickly coriaceous with very oblique veins. Flowers white, very fragrant, in short terminal simple racemes, the pedicels ½ to 1in. long. Calyx nearly 1in. long. Corolla-tube slender, 1½in. long, dilated only at the top; lobes nearly ½in. diameter, broadly rounded with the margins undulate and crisped. Hypogynous disk thick and fleshy, the margin forming a short ring round the base of the ovary. Capsule from a few in. to above 1ft. long, compressed (or nearly terete when fresh?); valves slightly concave; dilatations of the dissepiment rather thick and corky, almost reaching the margins of the

valves. Seeds transversely oblong, the wing on each side as long as the seed itself, together 14 lines long  $2\frac{1}{2}$  lines broad.—DC. Prod. ix. 207; *Dolichandrone heterophylla*, F. Muell. Fragm. iv. 149.

Hab.: Islands of the Gulf of Carpentaria, R. Brown, Henne; Rockingham Bay, W. Hill. *Dallachy*; and Gulf country.

### 3. HAUSSMANNIA, F. v. M.

(After Baron de Haussmann.)

Calyx campanulate, truncate, or minutely 5-toothed. Corolla tubular, incurved, dilated upwards; lobes 5, nearly equal, obscurely arranged in 2 lips induplicate-valvate in the bud. Stamens 4, inserted in the tube, longer than the corolla, with a fifth small staminodium; anther cells diverging or divaricate. Hypogynous disk cupular, completely enclosing the ovary. Ovary short, slightly compressed, the dissepiment transverse. Ovules numerous, in several rows in each placenta. Style with 2 ovate stigmatic lobes.—Woody climber. Leaves opposite, compound. Flowers in short racemes. Bracts minute; bracteoles none.

The genus, as far as at present known, is limited to the single Queensland species, and is very remarkable for the æstivation of the corolla.

1. **H. jucunda** (pleasing), F. v. M. *Fragm.* iv. 148; *Benth. Fl. Austr.* iv. 540. A tall glabrous woody climber. Leaflets 3, digitate and articulate at the end of a petiole of 1 to 2 in., each leaflet oval or elliptical, shortly acuminate, entire, membranous, penniveined, narrowed into a short petiolule, 2 to 4 in. long, and occasionally the central leaflet confluent with one of the lateral ones, but no simple leaves in the specimens seen. Flowers purple, in short racemes in the axils of the terminal pair of leaflets. Pedicels 2 to 3 lines long. Calyx 2 to 3 lines long. Corolla-tube, about 1 in. long; lobes ovate, not 1 line long, hairy inside. Stamens hairy at their insertion below the middle of the tube, shortly exceeding the corolla-lobes. Hypogynous disk above 1 line long. Capsule 3 to  $4\frac{1}{2}$  in. long and nearly  $1\frac{1}{2}$  in. broad, tapering towards both ends, outside smooth, opening loculicidally in 2 very concave valves, as in *Tecoma*; the seeds also overlaying each other in several rows, as in that genus. Seeds flat, pyriform, wrinkled, surrounded by a membranous wing which is elongated on either side to nearly half-an-inch, and broad as the seed which occupies the centre between them. Dissepiment broad, thick, and seems more firmly attached to the valves or one of them than in allied plants.

Hab.: Seaview Range, Rockingham Bay, *Dallachy*; Freshwater Creek, Cairns, L. J. Nugent. The plant is common in the tropical scrubs, but fruiting specimens are seldom obtained. The fruit is described from Mr. Nugent's specimen, in *Bot. Bull.* xiii. 11.

### 4. DIPLANTHERA, R. Br.

(Double anthers.)

(*Bulweria*, F. v. M.)

Calyx campanulate, with 5 equal lobes, valvate and connivent in the bud, and often cohering in 2 lips or in pairs after the calyx is open. Corolla with a broad campanulate tube and 5 broad nearly equal lobes, imbricate in the bud. Stamens 4, without the fifth staminodium, exerted, involute in the bud; anthers with 2 linear distinct cells, parallel in the bud, at length divaricate. Ovary 2-celled; ovules very numerous, crowded in several rows on 2 distinct but approximate placentas in each cell. Style long, with 2 oval, flat, stigmatic lobes. Capsule

oblong-fusiform, opening loculicidally in 2 woody valves leaving the placenta free. Seeds very flat, with a broad transparent wing.—Trees. Leaves simple, whorled or opposite. Flowers yellow in terminal panicles.

The species are few, and, besides Queensland, are found in Malacca and New Caledonia.

Large tree. Young growth softly tomentose. Leaves opposite or in whorls

of 4 . . . . . 1. *D. tetraphylla*.

Small tree. Young growth densely hirsute. Leaves opposite or in whorls

of 3 . . . . . 2. *D. hirsuta*.

1. ***D. tetraphylla*** (leaves in whorls of 4), *R. Br. Prod.* 449; *Benth. Fl. Austr.* iv. 540. Tree often lofty, stem with a diameter often exceeding 3ft.; bark thick, soft, and somewhat corky; the thick branchlets, under side of the leaves, and inflorescence covered with a thick soft tomentum, often assuming a golden or bronzed hue, and consisting of single or clustered but scarcely stellate hairs. Leaves crowded at the end of the branches, in whorls of 4 or the first leaves of young shoots opposite, on short petioles, ovate, obtuse, entire, 1 to 2ft. long, 1ft. or more broad, or those immediately under the panicle 6 to 8in., the upper surface glabrous or slightly scabrous. Flowers yellow, in a dense terminal panicle, nearly sessile above the last leaves, the primary branches whorled, each one dichotomously branched, with a flower shortly pedicellate in each fork. Bracts linear, minute. Calyx coriaceous, about  $\frac{1}{2}$ in. long, the lobes acute, as long as the tube. Corolla-tube shortly exceeding the calyx, the lobes as long as the tube, broadly rounded. Stamens and style exceeding the corolla by an inch or more, very divergent. Hypogynous disk rather thick. Capsule (only seen open with the valves detached) 2 to 3in. long, the valves hard and woody, smooth inside with a longitudinal line probably where the dissepiment was attached, the placenta-bearing dissepiment not broad and rather thick. Seeds apparently ripe but the embryo not perfect in those examined.—F. v. M. in *Seem. Journ. Bot.* v. 212; *Bulweria nobilissima* or *Tecomella Bulweri*, F. v. M. *Fragm.* iv. 147; *Deplanchea Bulwerii*, F. v. M. *Fragm.* v. 72.

Hab.: Endeavour River, *Banks and Solander*; Cape York, *M'Gillivray, Demel*; Rockingham Bay, *Dallachy*. A common tree in the tropical scrubs.

Wood of a whitish colour, close-grained and firm.—*Bailey's Cat. Ql. Woods*, No. 292.

2. ***D. hirsuta*** (hairy), *Bail. Bot. Bull.* xiv. 11. Described by collectors as a small tree. Branchlets quadrangular and densely hirsute. Leaves opposite or in whorls of three, narrow-lanceolate in outline, but very irregular, the ends of some being broadly truncate, attaining 20in. in length, with a breadth of  $6\frac{1}{2}$ in. about the centre, margins repand, crenulate, or deeply and very irregularly toothed, base cordate, and much undulate, petioles  $\frac{1}{2}$  to  $1\frac{1}{2}$  in., hirsute. Calyx  $\frac{1}{2}$ in. long, campanulate, coriaceous, appearing 3-lobed from 4 of the lobes being joined in pairs to near the apex, forming as it were two broad emarginate lobes, hairy outside, the inside bearing minute scale-like glands. Corolla yellow, ringent, 1in. long, spreading to  $1\frac{1}{2}$ in. wide, the lobes blunt, longer than the tube. Stamens exceeding the corolla by about  $1\frac{1}{2}$ in.; style about the length of the stamens, the stigmatic lobes ovate-apiculate. No fruit obtained.

Hab.: Stony Creek, Cairns (a shoot and loose flowers), *L. J. Nugent*. A large leaf and very young shoot gathered on Thursday Island, *E. Cowley*.

## ORDER XCII. PEDALINEÆ.

(S same, DC.)

Flowers irregular. Calyx 5-lobed or divided into 5 segments. Corolla tubular; lobes 5, spreading, often arranged in 2 lips, the lowest often rather larger than the others, imbricate or rarely valvate in the bud. Stamens 4,

didynamous, with a small fifth staminodium, rarely only 2 perfect; anthers 2-celled, the cells opening longitudinally. Ovary of 2 or rarely 3 or 4 carpels, but divided, at least after flowering, into twice as many cells. Ovules in each cell either several superposed in a single row or rarely solitary. Style filiform, with as many stigmatic lobes as carpels. Fruit dry, hard and indehiscent or opening in valves. Seeds with a thin testa. Albumen scanty or none. Embryo straight, with a very short radicle.—Herbs. Leaves all or at least the lower ones opposite. Flowers solitary in the axils of the floral leaves or bracts, the upper ones often forming a terminal raceme, with or without bracteoles.

A small Order dispersed over the tropical and subtropical regions both of the New and the Old World, the only Australian genus extending to the Eastern Archipelago.

TRIBE I. **Martyniææ**.—*Authers cells divaricate*. Ovary 1-celled with 2 parietal placentas. Capsule woody terminating in 2 curved beaks . . . . . 1. \***MARTYNIA**.

TRIBE II. **Sesameææ**.—*Authers dorsifixed, cells parallel*. Ovary 2-celled or spuriously 4-celled.

Capsule oblong, 2-valved. Unarmed . . . . . 2\***SESAMUM**.

TRIBE III. **Pretreææ**.—*Authers dorsifixed, cells parallel*. Ovary 1 to 4 cells, often spuriously 2 to 8-celled.

Fruit hard and indehiscent. Armed with conical prickles . . . . . 3 **JOSEPHINIA**,

### 1. \***MARTYNIA**, Linn.

(After John Martyn, F.R.S.)

Calyx campanulate, segments 5, unequal. Corolla unequally 5-lobed and puffed out below. Stamens 2, the front ones perfect or 4 and didynamous; staminodia 3 or 1. Capsule woody, terminating in 2 curved beaks. Herbs, clammy pubescent. Leaves opposite or alternate, cordate on long petioles.

A genus of few species; natives of the warm regions of America.

Leaves alternate. Corolla-tube yellowish-white and dotted; limb pale-violet marked with saffron and violet dots and lines . . . . . 1. *M. proboscidea*.

Leaves opposite.

Corolla-tube white, purple tinged, yellow dotted; limb pale-red, with a purple spot on each lobe . . . . . 2. *M. diandra*.

Corolla oblique, purplish-red; limb of 4 rounded lobes, the upper ones bifid . . . . . 3. *M. fragrans*.

1. **M. proboscidea** (proboscis-like), *Glox. Obs.* iii. Unicorn plant. A coarse heavy-scented annual about 2ft. high. Leaves cordate, roundish, often oblique, entire or obscurely undulate-lobed, 4 or more inches in diameter. Flowers in terminal racemes. Pedicels long. Bracts oblong-linear. Corolla  $1\frac{1}{2}$  to 2in. long, dull white, spotted within with some yellow or purple, also varying to light-yellow. Endocarp crested on the posterior suture only.—*Bot. Mag.* t. 1056.

Hab.: Warwick; naturalised. Native country, Mexico. The stigmatic lobes of the flower said to close when touched.

2. **M. diandra** (2 fertile stamens), *Glox. Obs.* 14, t. 1. Tiger-claw or Devil's-claw. An annual with stout erect finely glandulose-pilose stems 2 to 3ft. high. Leaves opposite, villous and viscid, round, cordate, more or less repand. Flowers in short-axillary or terminal racemes or singly. Calyx-teeth ovate-lanceolate, subtended by 2 large foliaceous bracts. Corolla  $1\frac{1}{2}$  to 2in. long, whitish; lobes 5, roundish, with yellow and purple blotches. Stamens 2, fertile. Capsule obliquely half-elliptical, rugose, coriaceous, with 2 short incurved sharp beaks dehiscing longitudinally by 2 valves, each bearing 4 thick ribs.

Hab.: Tropics of America, but now over-run many tropical and semi-tropical countries. Specimen received from Woothakata as a noxious weed.



3. **M. fragrans** (fragrant), *Lindl. Bot. Reg.* (1840). A plant 1 to 3ft. high, clothed with glandular hairs. Stems terete, erect, flexuous. Leaves usually opposite, petiolate, cordate in outline, 3-lobed; lobes rounded, angulate-sinnate, the middle one the longest. Racemes terminal; flowers large and fragrant. Pedicels as long as the flowers. Calyx large, inflated, plaited, or striated; teeth short, furnished at the base with 2 appressed fleshy bracts. Corolla scarcely longer than the calyx; mouth oblique; limb of 4 rounded spreading lobes, the upper bifid. Colour purplish-red, with yellow in the throat. Stamens 5, and with the style included. Capsule curved upwards, wrinkled, crested above, terminating in 2 incurved beaks, much longer than the capsule and hooked at the end.—*Bot. Mag. t. 4292.*

A Mexican plant now become naturalised, and a noxious weed to the sheep farmers, but fortunately does not spread at a rapid rate.

## 2. \***SESAMUM**, Linn.

(An Egyptian name of one species.)

Calyx small, 5-partite. Corolla tubular-ventricose, base subgibbous; limb 2-lipped, lobes 5, rounded. Stamens 4, didynamous, included. Anthers sagittate, cells 2 subparallel. Ovary 2-celled, early falsely 4-celled, cells many-ovuled. Capsule oblong or ovoid, loculicidally 2-valved, unarmed, in appearance 4-celled. Seeds numerous, obliquely oblong. Erect or prostrate herbs. Leaves opposite, upper alternate, entire-toothed, lobed or divided. Flowers axillary, solitary, or few and fascicled, on short pedicels, pale or purplish, sometimes yellow-marked.

The species are not many and belong to India and tropical or southern Africa.

1. **S. indicum** (Indian), *DC. Prod.* ix. 250; *C. B. Clarke in Hook. Fl. Brit. Ind.* iv. 387. An erect plant about 2ft. high, pubescent or puberulous. Leaves oblong or ovate, the lower ones often pedatisect, 3 to 5in. long, variable on the same plant; petiole  $\frac{1}{2}$  to 2in. long. Pedicels short, solitary, rarely 2 to 3-nate. Sepals 3 lines long, lanceolate. Corolla  $1\frac{1}{2}$ in., pubescent, whitish or with red-purplish or yellow marks. Capsule 4-angled, oblong, about 1in. long, 3 lines broad; erect, scabrid-pilose, usually shortly pointed, 2-valved half-way down or to the base, or ultimately 4-valved. Seeds brown, smooth.—*Wight, Ill. t. 163; Bot. Mag. t. 1638; S. orientalis*, Linn., *gærtn. Fruct. ii. 132, t. 110; Rheede Hort. Mal. ix. tt. 54, 55; Rumph Herb. Amboin. t. 76, fig. 1.*

Hab.: Cultivated in most hot countries; probably of Asiatic origin. It has long been cultivated in hot countries for the oil obtained from its seeds—known as “Til or Gingelly Oil.” Naturalised in many localities.

## 3. **JOSEPHINIA**, Vent.

(After the Empress Josephine.)

Calyx divided to the base into 5 segments. Corolla tubular, the lobes spreading, short, the lowest rather larger than the others. Stamens didynamous, included in the tube; anther-cells parallel, the connectivum usually tipped with a small gland. Ovary of 4, 6, or 8 cells, each with 1 erect ovule; stigmatic lobes, 2, 3, or 4. Fruit hard and indehiscent, armed with cornical prickles, shortly or not at all beaked. Seeds 1 in. each cell, oblong, erect.—Herbs with the habit of *Sesamum*. Leaves opposite, entire, toothed, or divided. Flowers in the upper axils on short pedicels without bracteoles.

The genus extends into the Archipelago. The two Australian species are endemic. The solitary erect ovules and seeds connect this genus with *Verbenaceæ*, but the habit of the corollas are those of *Pedalineæ*.—*Benth.*

Leaves glabrous or nearly so, quite entire. Ovary usually 8-celled. Fruit with a small terete or conical beak. . . . . 1. *J. grandiflora*.  
Plant densely villous. Lower leaves divided into 3 distinct segments. Ovary usually 4-celled. Fruit not beaked . . . . . 2. *J. Eugenia*.

1. **J. grandiflora** (large-flowered), *R. Br. Prod.* 520; *Benth. Fl. Austr.* iv. 556. Stems erect or diffuse (2 to 3ft. high?), glabrous or sprinkled with a few minute hairs. Leaves petiolate, lanceolate, or the lower ones ovate-lanceolate, all quite entire,  $1\frac{1}{2}$  to 3in. long, glabrous, and minutely and sparingly pubescent underneath. Pedicels shorter than the petiole. Calyx-segments narrow, acuminate, about 2 lines long, the upper one usually shorter. Corolla at least 1in. long, pubescent outside, the tube gibbous at the base on the upper side, gradually dilated upwards; lobes broad, the 4 upper ones nearly equal, the lower twice as long and broader than the others. Ovary in the flowers examined 8-celled; stigmatic lobes 4 (sometimes 3 according to Endlicher's figure). Fruit, ovoid-globular, under  $\frac{1}{2}$ in. diameter, very hard, villous with short soft hairs, armed with thick conical very unequal prickles, the persistent thickened base of the style forming a cylindrical or slightly conical beak, sometimes very short, sometimes at least as long as the prickles.—*Endl. Iconogr.* t. 106.

Hab.: Endeavour Straits, *R. Brown*; Low Island, *R. Brown*, *Henne*; islands of Howick's Group, *F. v. Mueller*; Three Isles and Lizard Island, *M'Gillivray*; Pelican and Haggerstone Islands, *A. Cunningham*.

Mr. Bentham points out that Endlicher has reversed the fruit (fig. x), so as to make the beak appear as a pedicel; the seeds are also reversed.

2. **J. Eugeniæ** (After the Empress Eugenie), *F. v. M. in Hook. Kew Journ.* ix. 370. t. 11; *Benth. Fl. Austr.* iv. 557. Stems procumbent ascending or erect, attaining 2ft. or rather more, every part of the plant densely villous with articulate simple or branched hairs. Lower leaves on long petioles mostly divided into 3 petiolate segments, the segments as well as the upper simple leaves oblong or lanceolate, coarsely-toothed. 1 to 2in. long; the uppermost floral ones small, lanceolate and entire. Flowers pink, very small, on short pedicels in the upper axils. Calyx-segments linear, obtuse, very hispid, scarcely above 1 line long. Corolla about 3 lines long, hirsute outside, the 4 upper lobes short and broad, the lowest one larger. Ovary 4-celled; stigmatic lobes 2, oblong-linear. Fruit ovoid, very hirsute, about  $\frac{1}{4}$ in. long, the prickles small, often not exceeding the hairs, without any beak, but slightly raised ribs across the summit.

Hab.: Suttor River, *Bowman*; and towards Cooper's Creek, *F. v. Mueller*.

## ORDER XCIII. ACANTHACEÆ.

Flowers irregular. Calyx more or less deeply divided into 5 lobes segments or distinct sepals, the upper one often smaller and sometimes wanting or the two lowest united into one. Corolla with a long or short tube, the limb either two-lipped or of 5 spreading lobes, contorted or otherwise imbricate in the bud or expanded into a single lower lip. Stamens inserted in the tube, 4 in pairs or 2 only, the upper ones then reduced to staminodia or entirely wanting. Anthers 2-celled or 1-celled by the abortion of the other cell. Ovary superior, 2-celled, with 2 or more ovules or rarely a single one in each cell. Style simple, usually subulate, with an entire or 2-lobed stigma, the lobes not dilated and the upper one often reduced to a small tooth. Capsule opening loculicidally in two valves, usually elastically recurved and bearing the placentas along their centre. Seeds usually flat, attached to hooked processes from the dissipation called *retinacula*, or in the first two tribes the seeds globular and resting on cup-shaped dilatations or mere papillæ, some times almost inconspicuous. Albumen none. Embryo usually curved.—Herbs shrubs or rarely trees. Leaves opposite, entire or rarely toothed, or in a few species not Australian, lobed. Flowers axillary or terminal, in spikes racemes or

clusters, more or less bracteate, the primary inflorescence centripetal, the secondary sometimes dichotomous and centrifugal. Bracteoles rarely wanting and sometimes large and leafy.

A large Order, diffused over both the New and the Old World, chiefly within the tropics, a very few species occurring in more temperate regions, either in the northern or the southern hemisphere.

TRIBE I. **Thunbergiæ**.—*Corolla-limb with 5 nearly equal spreading lobes, contorted in the bud. Seeds globular, resting on a cup-shaped expansion of the placenta.*

Stem twining. Calyx an entire or toothed ring concealed within the bracteoles . . . . . 1. THUNBERGIA.

TRIBE II. **Nelsoniæ**.—*Corolla-limb of 5 nearly equal lobes or 2-lipped, imbricate in the bud, the upper lobes or lip outside. Seeds globular. Retinacula none or reduced to minute papillæ.*

Corolla-lobes nearly equal. Stamens 2 . . . . . 2. NELSONIA.

Corolla-lobes nearly equal. Stamens 4 . . . . . 3. EBERMAYERIA.

TRIBE III. **Ruellieæ**.—*Corolla-lobes 5, nearly equal or 2-lipped, contorted in the bud. Seeds flat. Retinacula prominent.*

Corolla 2-lipped. Stamens 4. Ovules several in each cell . . . . . 4. HYGROPHILA.

Corolla-lobes nearly equal, spreading. Stamens 4. Ovules 6 or more in each cell . . . . . 5. RUELLIA.

TRIBE IV. **Acantheæ**.—*Corolla-tube short, upper lip obsolete, lower 3-lobed. Ovules 2 in each cell. Retinacula curved, hardened.*

Stamens 4. Leaves usually prickly-toothed . . . . . 6. ACANTHUS.

TRIBE V. **Justicieæ**.—*Corolla-lobes imbricate in bud. Retinacula curved, hardened. Anthers 2—1-celled; cells often spurred at the base, one frequently placed much above the other. Style shortly equally 2-fid or subentire.*

SUBTRIBE I. **Asystasiæ**.—*Ovules 2 in each cell. Corolla-lobes 5, subequal. Sepals 5, subequal. Stamens 4 or 2; anther-cells 2, subequal, parallel, mucous.*

Corolla-tube long, narrow or subventricose. Stamens 4 . . . . . 7. ASYSTASIA.

Corolla-tube slender. Stamens 2 . . . . . 8. ERANTHEMUM.

SUBTRIBE II. **Eujusticieæ**.—*Ovules 2 in each cell. Corollas distinctly 2-lipped.*

Bracts larger than the calyx-segments. Stamens 2; anthers 1-celled . . . . . 9. HYPOESTES.

Bracts clustered, shortly stalked. Stamens 2; anthers 2-celled. Placentas rising elastically from the base of the capsules . . . . . 10. DICLIPTERA.

Bracts in 1-sided spikes . . . . . 11. RUNGIA.

Placentas not rising elastically from the base of the capsule. Anther-cells placed one much higher than the other. Anther-cells minutely spurred at base . . . . . 12. JUSTICIA.

Bracts small. Corolla-tube elongate. Anther-cells parallel, subequal . . . . . 13. GRAFTOPHYLLUM.

# 1 \*THUNBERGIA, Linn. f.

(After C. P. Thunberg.)

Calyx reduced to an entire or many-toothed ring and concealed within 2 large bracteoles. Corolla-lobes 5, nearly equal, spreading, contorted in the bud. Stamens 4, included in the tube; anther-cells parallel. Ovules 2 in each cell of the ovary. Capsule globose and seed-bearing at the base, terminating in a flattened beak. Seeds globular, hollowed out on the inner face, and inserted on a cupular (sometimes very small) expansion of the placenta.—Twining or rarely dwarf and prostrate herbs. Flowers in axillary pedicels or in terminal racemes.

The genus is limited to tropical Asia and Africa and southern Africa.

1. \***T. fragrans** (fragrant), *Roxb. Cor. Pl. i. 47, t. 67; C. B. Clarke in Hook. Fl. Brit. Ind. iv. 390.* A slender-stemmed retrorsely-hairy or glabrate climber. Leaves ovate or oblong-acute, 2 to 3 in. long,  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. broad, cordate or hastate at the base; toothed; petioles  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. long. Pedicels 1 to 3 in. long, usually solitary in the axil, sometimes 2. Bracteoles  $\frac{3}{4}$  in. long, broadly falcate-oblong, subacute. Calyx in flower  $1\frac{1}{3}$  line, divided half-way down into 12 to 16

teeth, nearly glabrous, in fruit over 2 lines. Corolla  $1\frac{1}{4}$  in., pure white. Anther-cells elliptic, acute, base unappendaged. Ovary glabrous; style funnel-shaped, 2-lipped. Capsule  $\frac{3}{4}$  to 1 in. long, glabrous, shining. Seeds about 2 lines rugose. —*T. javanica*, Gærtn. Fruct. III. 22, t. 183; *T. arnhemica*, F. v. M. Fragma. ix. 73; and *T. Poirelli*, South. Sci. Rec. ii. 34.

Hab.: This common Indian species has become naturalised in many parts of the colony, especially in the tropics.

The following note is given by Mr. Trimen in his Ceylon Flora, part iii., 289:—"The flowers never have the slightest scent. Roxburgh bestowed the name *fragrans* from a peculiar and agreeable fragrance of the plant, which I am unable to detect; he expressly says that the flower is scentless." This most certainly agrees with the plants in Queensland. C. B. Clarke, however, in Hook. Fl. Brit. Ind., says the flowers are fragrant.

2. \****T. alata*** (winged), *Boj. in Sims, Bot. Mag. t. 2591*; *Benth. Fl. Austr. iv. 543*. A herbaceous softly pubescent or villous twiner. Leaves broadly angular-cordate, on rather long petioles which are always more or less winged. Flowers pale orange or in one variety white, with the tube purple inside, on axillary pedicels shorter than the leaves. Bracteoles herbaceous, ovate-lanceolate or ovate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Calyx reduced to a ring of from 10 to 12 small acute teeth. Corolla-tube shortly exceeding the bracteoles with 5 rounded spreading nearly equal lobes.—Nees in DC. Prod. xi. 58; Hook. Exot. Fl. t. 177; Bot. Mag. t. 3512.

Hab.: Naturalised near towns. A native of the S.E. coast of Africa or of the Mascarene Islands, long since cultivated in Indian as well as European gardens.

## 2. NELSONIA, R. Br.

(After D. Nelson, who accompanied Captain Cook.)

Calyx of 4 distinct segments, the lowest 2-fid. Corolla-lobes 5, nearly equal, the 2 upper ones outside in the bud. Stamens 2, included in the corolla-tube; anther-cells distinct, divergent; no staminodia. Ovules rather numerous; stigmatic lobes of the style unequal. Capsule 2-celled from the base, terminating in a seedless beak. Seeds small, globular, resting on minute scarcely conspicuous papillæ.—Diffuse herb. Flowers small, sessile in terminal leafy spikes.

The genus appears to be limited to a single species, a common tropical weed.

1. ***N. campestris*** (field plant), *R. Br. Prod. 481*; *Benth. Fl. Austr. iv. 543*. A diffuse or prostrate herb, the slender stems much branched, and extending sometimes to above 1 ft., clothed as well as the foliage with long soft hairs which are often white and silky on the young shoots and inflorescence. Leaves oblong or elliptical, narrowed into a short petiole or rarely broadly ovate or almost orbicular, rarely exceeding  $\frac{3}{4}$  in. except the radical and lowest which are sometimes much longer, the floral ones sessile, ovate, acute, 3 to 4 lines long, crowded or almost imbricate in short terminal spikes. Flowers nearly sessile, not exceeding the floral leaves. Calyx about 2 lines long, the upper and lower segments rather broader than the others, the lowest from minutely 2-toothed to deeply 2-lobed. Corolla-tube about as long as the calyx, the lobes rounded, 2 upper ones nearly  $1\frac{1}{2}$  line long, the three lower rather smaller. Capsule oblong-linear, not exceeding the floral leaves.—Endl. Iconogr. t. 79; *N. rotundifolia*, R. Br. l.c.; *N. tomentosa*, Dietr.; T. Anders. in Journ. Linn. Soc. ix. 450; the whole five species of *Nelsonia* and their numerous synonyms given by Nees in DC. Prod. xi. 65 to 67.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks and Solander*; Rochampton, *Dallachy*; and other tropical localities.

The species is a common tropical weed in Asia and Africa, and is already abundant in several parts of tropical America.

3. **EBERMAIERA**, Nees.

(After K. H. Ebermaier, a German writer on medicinal plants).

Calyx divided to the base into five segments, the upper one broader than the others. Corolla-lobes 5, nearly equal, the 2 upper ones outside in the bud. Stamens 4, in pairs, included in the corolla-tube; anthers ovate, transverse, 2-celled. Ovu'les numerous; stigmatic lobes of the style unequal. Capsule oblong-linear, not beaked, 2-celled from the base. Seeds numerous, very small, nearly globular; retinacula reduced to minute papillæ or quite inconspicuous.—Herbs. Flowers small, sessile in the axils of the floral leaves or bracts, forming terminal dense or interrupted leafy or leafless spikes.

The genus comprises a considerable number of species from tropical Asia and Africa, with a few American ones. The only Australian species is a common Asiatic one.

1. **E. glauca** (plant grey colored), *Nees in DC. Prod.* xi. 73; *Benth. Fl. Austr.* iv. 544. Stems at first simple and erect, at length diffuse prostrate or creeping and rooting at the nodes, with ascending or erect branches of  $\frac{1}{2}$  to 1 ft., the whole plant slightly pubescent, the inflorescence often glandular. Leaves oblong-lanceolate or elliptical, obtuse, narrowed into a petiole, 1 to 2 in. long, the floral ones much smaller, mostly under  $\frac{1}{2}$  in. Flowers nearly sessile in the axils of the floral leaves, between 2 leafy bracteoles about as long as the calyx, forming rather long leafy spikes, terminal, or sometimes also in the axils of the upper stem leaves. Calyx upper segments lanceolate, 3 to 4 lines long, lower ones linear and rather shorter. Corolla-tube about as long as the calyx, slightly dilated upwards; lobes short, obovate, obscurely 2-lipped. Capsule as long as the calyx.—T. Anders. in Journ. Linn. Soc. ix. 450; Wight, Ic. t. 1488.

Hab.: Recorded for Queensland by F. v. Mueller. Common in E. India and the Archipelago.

4. **HYGROPHILA**, R. Br.

(Found near water.)

Calyx more or less deeply divided into 5 or rarely 4 lobes or segments. Corolla-limb 2-lipped, the upper lip 2-lobed, the lower 3-lobed, the lobes usually short and contorted in the bud. Stamens 4, in pairs, or in species not Australian only 2 perfect; anthers erect, the cells parallel and equal. Style subulate, with a small upper tooth. Ovules several in each cell of the ovary. Capsule oblong or linear, 2-celled from the base. Seeds flat, retinacula hooked.—Erect or decumbent herbs. Flowers sessile in axillary clusters.

A small genus, widely distributed over the tropical and subtropical regions of the New and the Old World. The only Australian species is a common Asiatic one.

**H. salicifolia** (willow-leaved), *Nees in Wall. Pl. As. Rar. and in DC. Prod.* xi. 92; *Benth. Fl. Austr.* iv. 544. Stems erect or ascending, branched, from  $\frac{1}{2}$  to 1½ ft. high, glabrous or slightly pubescent with appressed hairs as well as the foliage. Leaves lanceolate or almost linear, contracted into a short petiole, 3 or 4 in. long in stout specimens, half that size in others. Flowers usually 2 or 3 together in the axils of the stem-leaves, purple or pale blue (or yellow according to *Dallachy*). Bracteoles concave, acute, usually shorter than the calyx. Calyx pubescent, tubular, the lobes shorter than the entire part, the 2 lower ones often more united. Corolla-tube scarcely exceeding the calyx, upper lip 2-lobed, the lower lip 3-lobed, convex, with 2 lines of hairs decurrent from the sinus, the lobes all nearly equal, slightly contorted or almost valvate in the bud. Stamens inserted near the top of the tube. Capsule linear, about  $\frac{1}{2}$  in. long. Seeds about 6 to 8 in each cell.—T. Anders. in Journ. Linn. Soc. ix. 456, with the synonyms adduced; *Ruellia salicifolia*, Vahl. Symb. iii. 84; *Hygrophila angustifolia*, R. Br. Prod. 479; Nees in DC. Prod. xi. 91.

Hab.: Endeavour River, Banks and Solander, R. Brown; Rockingham Bay, *Dallachy*; Broadsound, *Bowman*; Beddome Creek, *Thozet*; Moreton Bay, *W. Hill*.

## 5. RUELLIA, Linn.

(After John Ruelle, of Soissons, botanist to Francis I.)

(Dipteracanthus and Cryphiacanthus, Nees.)

Calyx more or less deeply divided into 5 lobes or segments. Corolla-lobes 5, nearly equal, spreading, contorted in the bud. Stamens 4, included in the corolla-tube; anther-cells parallel and equal. Ovules 6 or more in each cell of the ovary. Capsule oblong-linear or clavate, more or less contracted and seedless at the base, very rarely equally 2-celled throughout. Seeds flat; retinacula hooked, often denticulate at the top.—Herbs or rarely shrubs. Flowers usually blue, mostly axillary, solitary or clustered, rarely in terminal or axillary spikes.

A considerable genus, distributed over the warmer regions of the New and the Old World. The Australian species are all endemic.

SECT. I. **Dipteracanthus**.—*Bracteoles usually longer and broader than the calyx. Capsule contracted or flattened and seedless at the base.*

- Corolla with a slender tube of 1 in., the broader portion or throat half as long. Capsule  $\frac{3}{4}$  in. Flowers pedunculate. . . . . 1. *R. bracteata*.  
 Corolla-tube very shortly slender at the base, the throat much longer.  
 Capsule  $\frac{1}{2}$  in. long. Flowers nearly sessile.  
 Corolla-throat nearly 1 in. long . . . . . 2. *R. primulacea*.  
 Corolla-throat scarcely  $\frac{1}{2}$  in. long . . . . . 3. *R. corynotheca*

SECT. II. **Cryphiacanthus**.—*Bracteoles linear-subulate, shorter than the calyx or none. Capsule equally 2-celled from the base or nearly so.*

- Flowers sessile in the axils or nearly so. Bracteoles shorter than the calyx 4. *R. australis*.  
 Flowers distant in axillary leafless spikes. Bracteoles very small . . . . 5. *R. spiciflora*.  
 Flowers solitary on elongated pedicels. Bracteoles none . . . . . 6. *R. acaulis*.

1. **R. bracteata** (bracteoles prominent), *R. Br. Prod.* 479; *Benth. Fl. Austr.* iv. 546. Stems usually simple, 6 in. to 1 ft. high, more or less hirsute as well as the foliage. Leaves shortly petiolate, oblong, or elliptical, the larger ones above 2 in. long, the lowest small and obovate. Flowers blue, on axillary pedicels varying from  $\frac{1}{2}$  in. to above 1 in. in length. Bracteoles herbaceous, oval-oblong,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, enclosing the base of the flower. Calyx-segments narrow, 2 to 3 lines long. Corolla with a very slender straight tube of about 1 in., the campanulate broad part or throat nearly half that length, the lobes broad and rounded, the margins slightly crisped. Stamens inserted near the top of the slender tube and reaching to the top of the throat. Capsule nearly  $\frac{3}{4}$  in. long, contracted into a broad flattened seedless base. Seeds in the upper part, 7 or 8 in each cell.—*Endl. Iconogr. t.* 104 (the corolla-lobes more crisped than in any of the specimens seen); *Dipteracanthus bracteatus*, Nees in *DC. Prod.* xi. 143.

Hab.: Cape York, *M. Gillicray*.

The E. Indian *Ruellia suffruticosa*, Roxb., is evidently closely allied to if not identical with *R. bracteata*.—*Benth.*

2. **R. primulacea** (primula-like), *F. v. M. Herb.*; *Benth. Fl. Austr.* iv. 546. A perennial, apparently with the habit of *R. corynotheca*, but larger and more villous. Leaves ovate, nearly sessile,  $\frac{1}{2}$  to 1 in. long. Flowers large, blue, nearly sessile in the upper axils. Bracteoles herbaceous, oval or oblong, much longer than the calyx. Calyx segments narrow, 2 to 3 lines long. Corolla with an exceedingly short narrow base, the remainder of the tube much dilated, above 1 in. long, forming a long broad rather oblique throat; lobes broad, scarcely half as long as the tube. Capsule oblong-clavate, about  $\frac{1}{2}$  in. long, contracted and seedless at the base. Seeds about 6 in each cell.

Hab.: Burdekin River, *F. v. Mueller*; Selheim and Elliot Rivers, *Bowman*; Peak Downs, *Burket*; Port Denison, *E. Fitzalan*.

The species is commonly met with in northern inland localities.

3. **R. corynotheca** (capsule club-shaped), *F. v. M. Herb.*; *Benth. Fl. Austr.* iv. 546. A perennial, usually shortly scabrous-pubescent, with rather slender, decumbent or erect stems of 6in. to nearly 1ft. Leaves petiolate, mostly ovate and small, often under  $\frac{1}{2}$ in. and rarely 1in. long. Flowers nearly sessile in the upper axils. Bracteoles oblong-linear or oblong, contracted at the base, longer than the calyx. Calyx  $1\frac{1}{2}$  to 2 lines long, the segments united at the base. Corolla-tube 3 to 4 lines long, gradually dilated upwards, the lobes fully half as long as the tube. Capsule clavate, about  $\frac{1}{2}$ in. long, the lower portion contracted and seedless, 2 lines broad above the middle. Seeds about 4 in each cell, rather large, all attached very near the middle of the capsule.

Hab.: Burdekin River, *F. v. Mueller*; Suttor River, *Bowman, Dorsay*; Peak Downs, *Burket (F. v. M.)*.

Very near the E. Indian *R. patula*, Jacq., but the corolla-tube appears to be shorter and not so slender, and there may be a few other trifling differences.—*Benth.*

4. **R. australis** (southern), *R. Br. Prod.* 479; *Benth. Fl. Austr.* iv. 547. A small perennial with erect or diffuse branching stems often under 6in. but sometimes nearly 1ft. long, hirsute as well as the foliage or nearly glabrous. Leaves from obovate or oblong or under  $\frac{1}{2}$ in. to oblong lanceolate and 2in. long, narrowed into a petiole. Flowers blue, axillary, sessile or very shortly pedicellate, with narrow bracteoles shorter than or very rarely as long as the calyx. Calyx-segments subulate-acuminate, 3 to 4 or even 5 lines long. Corolla-tube exceeding the calyx, gradually but considerably enlarged upwards; lobes spreading, more than half as long and sometimes nearly as long as the tube. Stamens inserted near the base of the tube and the anthers scarcely reaching above the middle. Capsule about  $\frac{1}{2}$ in. long, mucronate, linear, not enlarged upwards, and usually 2-celled from the base. Seeds about 6 in each cell.—*Cav. Ic. vi.* 62, t. 586; *Nees in DC. Prod.* xi. 151 as to Brown's synonym, but not the plant described; *Cryphiacanthus australis*, *Nees in DC. Prod.* xi. 198.

Hab.: Bay of Inlets, *Banks and Solander*; Thirsty Sound and Keppel Bay, *R. Brown*; Cape York, *M'Gillivray*; Rockhampton, *Dallachy*; Warwick, *Beckler*.

Var. *scabra*. A coarse form. Leaves ovate or ovate-lanceolate, rigid and scabrous.—Capsule rather larger.—*Gilbert River, F. v. Mueller*; *Armadilla, Barton*.

Var. *pumila*. Very small and nearly glabrous. Leaves mostly oblong.—*R. pumilio*, *R. Br. Prod.* 479; *Dipteracanthus pumilio*, *Nees in DC. Prod.* xi. 124.—*Burdekin River, F. v. Mueller*; *Rockhampton, O'Shanesey*; *Darling Downs, Law*; *Armadilla, Barton*.

5. **R. spiciflora** (inflorescence in spikes), *F. v. M. Herb.*; *Benth. Fl. Austr.* iv. 547. Stems creeping and rooting at the base, ascending, under 1ft. long in the specimens seen, loosely pubescent as well as the veins of the leaves underneath. Leaves petiolate, ovate or oblong, those of each pair very unequal, the larger one 1 to 2in. long. Flowers distant, along slender axillary peduncles, forming interrupted spikes, each one sessile within a small linear-setaceous bract with still smaller bracteoles. Calyx-segments linear setaceous. Corolla-tube rather broad, nearly  $\frac{1}{2}$ in. long, the lobes about half as long as the tube. Stamens short. Capsule nearly  $\frac{1}{2}$ in. long, apparently like that of *R. australis*, but not seen ripe.

Hab.: Archer's Creek, *Leichhardt*.

The habit of the plant is that of *Asystasia gangetica*, *T. Anders. (d. coromandeliana, Nees)*, but the contorted corolla-lobes and the stamens are those of *Ruellia australis*.—*Benth.*

6. **R. acaulis** (stemless), *R. Br. Prod.* 479; *Benth. Fl. Austr.* iv. 547. A dwarf almost stemless hirsute perennial, with a short branching stock, rarely emitting a few rather longer decumbent stems. Leaves mostly radical or nearly so, petiolate, oval-elliptical to oblong, obtuse, from under 1in. to nearly 2in. long. Flowers on pedicels varying from about the length of the calyx to three

times that length, and always longer than the fruit. Bracteoles none. Calyx-segments 4 to 5 lines long. Corolla-tube about  $\frac{1}{2}$  in. long, not much dilated, the lobes about half as long as the tube. Stamens of *R. australis*. Capsule 6 to 8 lines long, 2-celled from the base.—Nees in DC. Prod. xi. 154.

Hab.: Bustard Bay, Bay of Inlets and Cape Grafton, *Banks and Solander*; Port Denison, *Fitzalan*; Burdekin River, *F. v. Mueller*; Suttor River, *Thozet*; Broadsound, *Bowman*; Boguee River, *Dallachy*,

### 6. ACANTHUS, Linn.

(In reference to some species being spiny).

(*Dilivaria*, *Juss.*)

Calyx divided to the base into 4 distinct segments or sepals. Corolla with a very short tube; the upper lip short and truncate or entirely wanting, the lower lip large entire or 3-lobed. Stamens 4, exserted; anthers 1-celled, hirsute or ciliate. Ovules 2 in each cell of the ovary. Capsule 2-celled from the base. Seeds large, flat; retinacula thick.—Herbs or shrubs. Leaves usually prickly-toothed. Flowers in bracteate spikes.

A small genus, spread over tropical Asia, Africa, and southern Europe. The only Australian species is a common maritime plant in tropical Asia.

1. **A. ilicifolius** (Holly-leaved), *Linn.*; *T. Anders. in Journ. Linn. Soc.* ix. 511; *Benth. Fl. Austr.* iv. 548. An erect glabrous shrub of several feet. Leaves sessile or nearly so, oval or broadly oblong, 4 to 8 in. long, coriaceous and shining when full grown, bordered with undulate prickly teeth or short lobes or rarely entire, with a pair of divaricate short prickles at their base in the place of stipules, sometimes 4 or 5 lines long, sometimes very short or entirely wanting. Spikes terminal or in the upper axils, 6 in. to 1 ft. long. Bracts ovate, acute or obtuse, often at least half as long as the calyx; bracteoles similar but smaller, sometimes very small or wanting. Calyx-segments or sepals oblong, coriaceous, the 2 outer ones 6 to 8 lines long, the 2 inner ones smaller. Corolla blue, upper lip exceedingly short truncate and coriaceous, the lower expanded into an obovate entire or shortly 3-lobed limb of above 1 in. Filaments, hard, thick and shining, more than half as long as the lower lip. Anthers 3 to 4 lines long, very densely ciliate-hirsute. Capsule  $\frac{3}{4}$  to 1 in. long, coriaceous, shining, very obtuse.—*R. Br. Prod.* 480; *Dilivaria ilicifolia*, *Juss.*; *Nees in DC. Prod.* xi. 268; *Wight, Ic.* t. 459.

Hab.: Gulf of Carpentaria, *R. Brown*; Cape York, *Damel*; Endeavour River, *Banks and Solander*; Cape Conway, *A. Cunningham*; Rockhampton, *O'Shanesy, Thozet*. Common in most northern coastal swamps.

### 7. ASYSTASIA, Blume.

(Derivation obscure.)

Calyx deeply divided into 5 narrow segments. Corolla-tube short or long, funnel-shaped, ventricose or narrow; lobes 5, sub-equal, imbricate in the bud. Stamens 4, all perfect, didynamus, subequal; anthers oblong, cells parallel, approximate, base minutely spurred or submuticus, the points only obscurely whitened. Ovary 4-ovulate, very hairy; stigma minutely bifid or subcapitate. Capsule elliptic, 4-seeded, base contracted, solid. Seeds compressed, orbicular or irregularly angular, rugose or tubercular, glabrous. Herbs or undershrubs, with entire leaves. Spikes or racemes lax or dense, simple or compound, 1-sided or suberect; bracts and bracteoles linear, usually shorter than the calyx; flowers opposite or alternate, usually solitary, blue, purple, rose, or yellow.

The species of this genus are met with in tropical Asia and South Africa, but not to my knowledge in Australia until I met with the species, here described, on Thursday Island.



1. **A. australasica** (Australian), *Bail. Q. Ag. Jl.* i. 230. A rather straggling plant about 18in. high, slightly branched, stems somewhat erect. Leaves membranous, 4 or 5in. long,  $2\frac{1}{2}$ in. broad, with a long abruptly acuminate point, rounded and slightly decurrent on the petiole which is slender and often nearly  $2\frac{1}{2}$ in. long. Flowers lateral, distant, pale-bluish, in terminal racemes of 2 or 3in., pedicels about 3 lines; calyx-tube short, lobes very narrow, about 3 lines long. Corolla-tube  $\frac{1}{2}$ in., expanding upwards, lobes rather short and rounded. Stamens 4, in pairs, not exerted, style about the length of the stamens. Capsule seedless in the lower half, the apex rostrate, seeds 4 in the centre of capsule, prominently tuberculose on each face, the margins sinuate, 2 lines diameter.

Hab.: Thursday Island, Torres Strait. Under trees in the gullies between the hills.

This Australian species somewhat resembles *A. coromandeliana*, Nees.

### 8. ERANTHEMUM, Linn,

(From *eran*, to love, and *anthemon*, a flower; referring to the beauty of the flowers.)

Calyx deeply divided into 5 lobes or segments. Corolla-tube long and slender; limb spreading, 5-lobed, the lobes nearly equal, imbricate but not contorted in the bud. Stamens 2, inserted high up in the tube; anthers partially exerted, with 2 parallel and equal cells; staminodia 2, usually very small. Ovules usually 2 in each cell. Capsule oblong-clavate or linear, much contracted and seedless at the base. Seeds flat; retinacula curved.—Herbs undershrubs or shrubs. Flowers solitary or in little cymes of 3 to 5, sessile or very shortly pedunculate in the upper axils or more frequently forming terminal interrupted spikes with the floral leaves reduced to small bracts. Bracteoles very small or none.

A considerable genus, dispersed over the tropical and subtropical regions of the New as well as the Old World. The two Australian species appear to be both endemic.

Herb with a creeping rhizome and erect nearly simple stems. Flowers in

spikes	1. <i>E. variable</i> .
Slender branching shrub. Flowers axillary . . . . .	2. <i>E. tenellum</i> .

1. **E. variable** (habit variable), *R. Br. Prod.* 477; *Benth. Fl. Austr.* iv. 555. A perennial with a creeping rhizome and ascending or erect simple or slightly branched stems varying from a few inches to above 1ft. high, the whole plant glabrous, pubescent, or hirsute. Leaves petiolate, ovate-oblong lanceolate or linear, 1 to 3in. long. Flowers white, solitary or rarely in little cymes of 3 or 5, in the axils of bracts always very small and sometimes almost inconspicuous, forming racemes or spikes, sometimes short and dense in the upper axils, but mostly slender interrupted and terminal; pedicels very short. Calyx-segments linear-setaceous, varying from under 2 to above 4 lines in length. Corolla glabrous or pubescent, the slender straight tube 5 to 8 lines long; lobes oblong, from under half the length of the tube to nearly its length. Capsule about  $\frac{1}{2}$ in. long, the lower half contracted and seedless.—Nees in DC. *Prod.* xi. 456.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others; Rockhampton and Rockingham Bay, *Dallachy*; Nerook Creek, Broadsound and Amity Creek, *Bowman*; Wide Bay, *Bidwill*; Burdekin River, *F. v. Mueller*; Cape York, *M. Gillivray*. Throughout the colony, very common and variable.

Var. *molle*. Leaves rather large, ovate, thin, softly pubescent. Flowers distant in slender leafless racemes.—Cape York, *Damel*; Rockhampton, *Dallachy*.

Var. *lineare*. Leaves narrow linear.—Gilbert River, *F. v. Mueller*; Moreton Bay, *C. Stuart*.

The plant figured in *Paxt. Mag.* xiii. 75 as *E. variable* is a very different species, not Australian.

2. **E. tenellum** (slender), *Benth. Fl. Austr.* iv. 555. An erect shrub of 2 to 3 ft. with slender scabrous-pubescent or glabrous branches. Leaves petiolate, ovate or oblong, those of each pair very unequal in size, the larger one sometimes rather above 1 in. long, but usually half that size, and its opposite one much smaller. Flowers white, solitary in the axils, on short pedicels. Calyx-segments linear-setaceous, under 2 lines long. Corolla like the smaller form of *E. variabile*.

Hab.: In various localities.

Evidently nearly allied to *E. tuberculatum*, Hook. Bot. Mag. t. 5405, but without the peculiar warts of that species, the flowers smaller, and the leaves differently shaped.—*Benth.*

### 9. HYPOESTES, R. Br.

(From *hypo* under and *estia* house.—The bracts covering the calyx.)

Calyx more or less deeply divided into 5 lobes or segments. Corolla with a slender tube deeply 2-lipped, the upper lip narrow, entire, or rarely notched, the lower 3-lobed. Stamens 2, often nearly as long as the corolla; anthers linear, 1-celled. Ovules 2 in each cell of the ovary. Style bifid at the top. Capsule compressed and seedless at the base, oblong or clavate. Seeds flat; retinacula subulate.—Herbs shrubs or small trees. Flowers solitary or 2 or 3 together, within a cylindrical or clavate involucre of 2 pairs of bracts often united to the middle, the inner pair alternating with the outer, the involucres in axillary clusters or spikes or in terminal panicles.

The genus is dispersed over Africa and tropical Asia. The Australian varieties or species appear to be endemic, but require further comparison with some forms from the Eastern Archipelago of which we have very imperfect specimens.—*Benth.*

1. **H. floribunda** (free flowerer), *R. Br. Prod.* 474; *Benth. Fl. Austr.* iv. 553. An erect branching perennial, attaining 2 or 3 ft. and usually glabrous except the minutely glandular-pubescent inflorescence. Leaves ovate-lanceolate or almost linear, acutely acuminate, contracted into a rather long petiole, usually thin and membranous and 2 to 4 in. long, but occasionally much larger. Involucres usually numerous in dense axillary clusters or racemes or loose terminal panicles each involucre tubular, concrete, 2 to 4 lines long, 4-lobed to about the middle, the lobes acute, the 2 inner ones rather smaller. Flowers solitary in the involucre or rarely 2 or 3 together, but the accessory ones mostly rudimentary. Calyx very thin, divided to about the middle, much shorter than the involucre. Corolla slender, about  $\frac{3}{4}$  in. long or rather larger, the lips as long as the tube, the upper one linear and entire, the lower one much broader, very shortly 3-lobed. Stamens nearly as long as the lips. Capsule rather narrow, 5 to 6 lines long.—Endl. Iconogr. t. 105; *H. laxiflora* and *H. floribunda* (partly), Nees in DC. Prod. xi. 508, 509.

The following forms of this very variable plant might be distributed according to the inflorescence into three principal varieties or perhaps species, two of which are found in this colony;—(*Benth.*)

1 *Densiflora*. Involucres mostly 2 to 3 lines long in short dense spikes or clusters chiefly axillary.—Moreton Bay, *A. Cunningham*, *F. v. Mueller*; Rockhampton, *Thoset*; Edgcombe and Rockingham Bays, *Dallachy*; Nerkol Creek, *Bowman*; Port Denison, *Fitzalan*. (All nearly glabrous).

Var. *canescens*. Branches inflorescence and under side of the leaves hoary with a very minute pubescence.—Cape York, *Daemcl*.

Var. *pubescens*. Rather densely clothed with a scabrous or a soft pubescence.—Wide Bay, *Bidwill*; Burdekin River, *Leichhardt*; N. coast of Arnhem's Land, *Kinley*; also other southern localities.

2. *Paniculata*. Involucre usually 3 to 4 lines long, in elongated interrupted spikes, usually numerous in the upper axils, forming rather large terminal panicles.—Shoalwater Bay, *R. Brown*.

## 10. DICLIPTERA, Juss.

(Referring to the 2 bracts which conceal the calyx.)

(Brochosiphon, Nees).

Calyx deeply divided into 5 lobes or segments. Corolla-tube usually slender, dilated at the throat, the upper lip concave entire or notched, the lower broader nearly entire or 3-lobed, the middle lobe much broader than the others. Stamens 2, ascending under the upper lip; anthers 2-celled, the cells placed usually one higher than the other, but without any basal appendage. Ovules 2 in each cell. Capsule usually flat, shortly contracted and seedless at the base, the dissepiment separating from the valves when opened and turning upwards elastically with the retinacula. Seeds flat.—Herbs. Flowers 1 to 3 together, sessile within a flattened involucre of 2 bracts concealing the calyx, the involucre usually several in clusters or short cymes, in the axils of the floral leaves or forming terminal loose spikes or racemes, with usually 2 subulate or spinescent bracts outside the flat ones. Corolla, owing to the peculiar inflorescence, appearing frequently resupinate with relation to the main axis, the upper entire or 2-notched lip becoming the lowest.

A considerable genus dispersed over the tropical and subtropical regions of the New and the Old World.

- |                                                                                                                                               |                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Involucral bracts oblong lanceolate, acuminate cuspidate, minutely pubescent, the clusters mostly in axillary whorls . . . . .                | 1. <i>D. Leonotis</i> . |
| Involucral bracts orbicular, very flat, glabrous or glandular-pubescent, all in axillary clusters . . . . .                                   | 2. <i>D. glabra</i> .   |
| Involucral bracts ovate, aristate, convex, ciliate-hirsute on the upper side, the clusters forming terminal loose spikes or racemes . . . . . | 3. <i>D. spicata</i> .  |

1. **D. Leonotis** (Leonotis-like), *Dalz., Clarke in Hook., Fl. Brit. Ind.* iv. 553. An erect herb. Leaves elliptical acuminate glabrous, 3 in. long, 1 in. broad on petioles of  $\frac{1}{2}$  in. Flower clusters mostly in axillary whorls. Bracts about 6 lines long and  $1\frac{1}{4}$  line broad, much acuminate. Corolla about 8 lines long. Capsule 3 lines long, very hairy. Seeds minutely glandulose-papillose, scarcely verrucose.—*D. Burmanni*, Nees. in Wall. Pl. As. Rar. iii. 112 and F. v. M., *Fragm.* vii. 62.

Hab.: Near Rockingham Bay and Herbert River, *J. Dallachy* (F. v. M.).

2. **D. glabra** (glabrous), *Dene. Herb. Tim.* 55, *Benth. Fl. Austr.* iv. 552. A much-branched annual of 1 to 2 ft., glabrous or the foliage sprinkled with a few rather rigid hairs. Leaves lanceolate or almost linear, mostly acute, contracted into a very short petiole, 1 to 2 in. long. Involucre either 2 sessile in the axils or 4 in pairs on 2 very short peduncles or several in a more or less cymose but very dense cluster, the involucral bracts very broadly ovate or nearly orbicular, mucronate-acute, glabrous or glandular-pubescent and ciliate, flat and usually unequal, the larger one 3 to 6 lines diameter, and always with an outer pair of rigid linear-subulate spreading or recurved outer bracts or spines. Flowers within the bracts solitary or rarely 2 or 3, with minute bracteoles. Calyx 1 to  $1\frac{1}{2}$  line long, divided to below the middle into linear-lanceolate lobes. Corolla shortly exceeding the bracteoles, the lips nearly as long as the tube, the upper one ovate and notched, the lower one broad and 3-toothed. Capsule very small, flat, nearly orbicular, usually 2-seeded.—Nees in DC. Prod. xi. 476; *Brochosiphon australis*, Nees. l.c. 492; *Dicliptera armata*, F. v. M. *Fragm.* vi. 88.

Hab.: Gilbert River, *R. Daintree* (F. v. M.)

3. **D. spicata** (flowers in spikes), *Dene. Herb. Tim.* 56, *Benth. Fl. Austr.* iv. 553. An erect paniculately branched annual of 1 to 2 ft., the stem and leaves glabrous or minutely pubescent. Leaves lanceolate or almost linear, very acute and mucronate, almost aristate, narrowed into a petiole, 1 to 2 in. long, the flora

ones narrower and shorter. Involucres usually 3 on a common peduncle in the axil of each floral leaf and sometimes a second shorter peduncle in the same axil with a single involucre, the clusters of involucres numerous in terminal racemes leafy at the base, the upper floral leaves reduced to subulate bracts. Involucral bracts ovate, acute and aristate, the margins recurved, the upper or inner surface convex and hirsute, the larger one of each pair 3 to 4 lines long, with an external pair of subulate bracts. Corolla slender, shorter than the bracts, the lips as long as the tube. Stamens 2. Capsule clavate, ovate. Seeds 2, muricate.—Nees in DC. Prod. xi. 479; *D. racemifera*, F. v. M. Fragm. vi. 89.

Hab.: Cape York, *Daemel*.

Also in Timor; the typical specimens received from Decaisne, as well as others in the Banksian Herbarium, agree precisely with the Australian ones.—*Benth*.

### 11. \**RUNGIA*, Nees.

(After Dr. Ferd. Runge.)

Calyx small deeply 5-lobed; segments linear-lanceolate. Corolla small bluish or white; limb 2-lipped, upper lip emarginate shorter than the lower 3-lobed lip. Stamens 2; anthers 2-celled, cells parallel, subequal, or more often superposed; lower cell mucous or white-tailed. Ovary 4-ovulate. Style filiform, minutely bifid. Capsule ovoid or oblong, shortly stalked; after dehiscence the placentas with the retinacula rise elastically from the base of the capsule, scattering the seed. Seeds, 4 compressed, orbicular, glabrous, verrucose, sometimes minutely, sometimes very strongly, so that the seed is concentrically rugose or suberistate. Diffuse or erect herbs or shrubs. Leaves entire. Spikes dense, terminal or axillary, one-sided. Bracts 2-ranked, or 4-ranked, with two of the ranks often flowerless; flowering bracts often scarious-margined; bracteoles similar to the bracts or narrow.

The species belonging to Asia and tropical Africa.

1. *R. latio*r (diffuse), Nees in DC. Prod. xi. 472: Clarke in Hook. Fl. Brit. Ind. iv. 546. Stems diffuse, herbaceous, hairy. Leaves ovate to broad lanceolate, cuneate at both ends, petiolate. Spikes oblong, dense, often clustered, about 1 in. long. Bracts roundly-obovate margins hairy, obscurely 4-seriate; bracteoles similar to the bracts, but smaller. Calyx nearly  $1\frac{1}{2}$  line long, segments linear-lanceolate, hairy. Corolla 4 lines long. Anther-cells superposed, lower white tailed. Capsule 4 lines long, nearly glabrous. Seeds small, minutely glandular-verrucose ultimately glabrous.

Hab: The above Indian species or one closely allied has become naturalised near Cairns. My specimens, which, however, were not perfect, were received from the late Mr. E. Cowley.

### 12. *JUSTICIA*, Linn.

(After J. Justice, a Scotch horticulturist).

(*Rostellularia* and *Rhaphidospora*, Nees.)

Calyx divided to the base into 5 or 4 segments. Corolla 2-lipped, the upper lip erect, concave, entire or notched, the lower convex or with a longitudinal fold and veined in the centre, 3-lobed. Stamens 2; anther-cells oblique, one attached higher up than the other, the lower one usually mucronate or spurred. Ovules 2 in each cell of the ovary. Style usually entire. Capsule contracted or compressed and seedless at the base. Seeds flat; retinacula obtuse.—Herbs or shrubs. Flowers solitary or in clusters or cymes, axillary or forming terminal spikes or panicles. Bracts various.

A large genus, widely distributed over the tropical and subtropical regions of the globe. Flowers (small) in dense terminal bracteate spikes.

Bracts linear or lanceolate, obtuse or acute, hispid or ciliate, bordered

sometimes by a broad white margin . . . . . 1. *J. procumbens*.

Bracts about 3 lines long, lanceolate, with a few setæ on the margins and midrib . . . . .	2. <i>J. notha</i> .
Flowers in axillary sessile clusters surrounded by a few broad obcordate bracts . . . . .	3. <i>J. hygrophiloides</i> .
Flowers in pairs on axillary simple or forked peduncles. Bracts setaceous . . . . .	4. <i>J. cavernarum</i> .
Flowers in a terminal dichotomous panicle . . . . .	5. <i>J. eranthemoides</i> .

1. **J. procumbens** (habit of plant), *Linn.*; *T. Anders. in Journ. Linn. Soc.* ix. 511, *Benth. Fl. Austr.* iv. 549. A procumbent, prostrate or rarely erect annual, often extending to above 1 or 2 ft. when trailing, shorter when erect. Leaves usually oblong lanceolate or almost linear, the lower ones small and more ovate, sometimes all ovate from  $\frac{1}{2}$  to 1 in. long or all narrow and then sometimes nearly 2 in. long; as well as the whole plant pubescent hirsute or nearly glabrous. Flowers pink or white, solitary under each bract, in terminal rather dense spikes of  $\frac{3}{4}$  to above 1 in., with often 1 or two pairs of flowers at some distance below. Bracts linear-lanceolate or linear, acute, hirsute and ciliate, as long as the calyx; bracteoles rather smaller; calyx-segments 4 with occasionally a small fifth one, linear, 2 to 3 or rarely 4 lines long. Corolla-tube nearly as long as the calyx; upper lip short, erect; lower one broad, spreading, nearly as long as the tube. Lower anther-cell spurred and often empty. Capsule 3 to 4 lines long, the seedless base short.—*Rostellaria* (or *Rostellularia*) *procumbens*, *Nees in Wall. Pl. As. Rar.*, and in *DC Prod.* ix. 371; *Wight, Ic.* t. 1539; *Justicia juncea*, *J. media*, and *J. ascendens*, *R. Br. Prod.* 476; *Rostellularia media* and *R. juncea*, *Nees in DC Prod.* ix. 374, 376; *R. pogonantha*, *F. v. M. in Linnæa*, xxv. 431; besides the numerous synonyms adduced by *T. Anderson*, l.c.

Hab.: Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks and Solander*; Thirsty Sound, Broadsound, Keppel Bay, etc., *R. Brown*, and from very numerous stations both on the coast and in the interior by most of the subsequent collectors.

*Var. peploides*, (Water Purslane-like). Leaves ovate oblong or broadly lanceolate, on longer petioles than in the type, and not so much contracted at the base, usually pubescent. Spikes cylindrical, compact,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, very rarely interrupted at the base. Flowers white or pinkish. Bracts and bracteoles obtuse, bordered by a broad white margin. Calyx-segments also somewhat membranous of the margin, but acute.—*J. peploides*, *T. Anders in Journ. Linn. Soc.* ix. 511; *Benth. Fl. Austr.* iv. 550; *C. B. Clarke in Hook. Fl. Brit. Ind.* iv. 537, records this plant as a form of *T. quinqueangularis*, *Kœn.*; *Rostellaria peploides*, *Nees*.

Brisbane river, Moreton Bay, a common plant of the colony, also in E. India.

2. **J. notha** (spurious), *C. B. Clarke in Hook. in Fl. Brit. Ind.* iv. 537. Stems simple or with a few erect branches from the base, about 1 ft. high, glabrous, almost terete, more or less marked with 4 or more lines or angles, often much contracted at the nodes below the leaves in the dried specimens. Leaves about  $1\frac{1}{2}$  in. long, sessile, oblong, obtuse or acuminate at the apex, sub-obtuse and sometimes more or less auriculate at the base, coriaceous, irregularly transversely lineolate, glabrate above, when young bearing white setæ on the nerves beneath. Spikes about 2 in. long, terminal, solitary, and dense. Bracts about 3 lines long, lanceolate (elliptic, *Clarke*), usually erect, with a few setæ on the margins and midrib, especially towards the end, otherwise glabrous. Flowers hairy, corolla white with purplish lines inside. Capsule, ( $2\frac{1}{2}$  lines, *Clarke*), none on the Queensland specimens to hand. *Rostellularia simplex*, *Wight Ic.* t. 1542 (not of *D. Don.*)—*Clarke, l.c.*; *Bail. in Ql. Agri. Journ.* iv. 464.

Hab.: Herberton, *R. C. Burton*; Irvinebank, *F. Bennet*. Evidently indigenous in Queensland. Habitats according to *Hooker l.c.* doubtful.

3. **J. hygrophiloides** (*Hygrophila*-like), *F. v. M. Fragm.* vi. 89; *Benth. Fl. Austr.* iv. 550. An erect densely-branched shrub, glabrous or minutely pubescent. Leaves ovate-lanceolate or lanceolate, obtuse, narrowed into a short petiole, 1 to  $1\frac{1}{2}$  or rarely 2 in. long. Flowers white or said to be sometimes yellow, in axillary clusters of 2 to 6, surrounded by 3 or 4 very broadly obcordate or 2-lobed

obtuse leafy bracts, at least as long as the calyx and rather broader than long. Calyx-segments 5 or rarely 4, linear-subulate, about 3 lines long. Corolla under  $\frac{1}{2}$  in. long, the tube shorter than the calyx, the lips as long as the tube, the upper one concave and notched, the lower one broadly obovate, shortly divided into 3 broad nearly equal lobes. Stamens nearly as long as the upper lip, the lower anther-cell with a basal appendage or spur. Capsule oblong, obtuse, about as long as the calyx, the basal seedless part very variable in length, sometimes very short. Seeds 2 in each cell.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*, *C. Stuart*; Cape Conway, *A. Cunningham*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy*, *O'Shanesy*.

4. **J. cavernarum** (found near caverns), *F. r. M. Fragm.* vi. 91, *Benth. Fl. Austr.* iv. 550. Branches slender, apparently decumbent or divaricate, shortly hirsute or pubescent as well as the foliage and inflorescence. Leaves petiolate, ovate, 1 to  $1\frac{1}{2}$  in. long. Peduncles in one axil of each pair of leaves, longer than the leaves, bearing at the end 2 sessile flowers, or forked with 2 sessile flowers at the end of each branch. Bracts and bracteoles setaceous, shorter than the calyx. Calyx-segments linear-setaceous, not 2 lines long. Corolla small, pubescent outside, glabrous inside. Stamens 2; anthers 2-celled with the lower cell conspicuously spurred.

Hab.: Mountain caves near Rockhampton, *Thozet*.

Described from fragmentary specimens in Herb. F. Mueller, which closely resemble the pubescent variety of the E. Indian *J. glabra*, Koen. (*Rhaphidospora glabra*, Nees), but are not in a state to determine whether they really belong or not to that species.—*Benth.*

### 13. GRAPTOPHYLLUM, Ness.

(Markings on leaves of some species resembling writing).

(*Earlia*, *F. v. M.*)

Calyx divided to the base into 5 segments. Corolla-tube incurved, the limb 2-lipped, the upper lip concave, incurved, notched, the lower divided to the base into 3 nearly equal lobes. Stamens 2, ascending under the upper lip, anther-cells parallel, nearly equal, without base appendages; staminodia 2. Ovules 2 in each cell of the ovary. Capsule oblong-clavate, contracted into a solid seedless base. Seeds flat; retinacula hooked.—Tall shrubs or small trees with glabrous shining leaves. Flowers red, in axillary or terminal clusters or short racemes. Bracts and bracteoles very small.

Besides the three Queensland endemic species, there is only one known and commonly cultivated in tropical Asia, but of uncertain origin, probably from some of the early visited islands of the Eastern Archipelago. It is the *G. pictum*, Nees, known in European hothouses under the name of the *Curcature-plant*, and only differs in foliage from *G. ilicifolium*.—*Benth. in part.*

A spiny shrub. Leaves ovate, with few teeth . . . . . 1. *G. spinigerum*.  
Leaves small, oblong, entire or minutely toothed. . . . . 2. *G. Earlii*.  
Leaves large, broadly ovate, prickly-toothed . . . . . 3. *G. ilicifolium*.

1. **G. spinigerum** (spiny), *F. v. M. Fragm.* xi. 17. A tall spiny shrub. Stems slender, armed with axillary slender spines  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Bark loose. Leaves rhomboid-ovate, the large ones 2 in. long, almost sessile, more or less dentate. Flowers small, axillary, often 3 on very short peduncles, pedicels slender, rather long. Calyx-lobes about 1 line. Corolla about 5 lines long, the lobes about half the length of the tube, the upper lip bidentate, the lower tridentate. Staminodia very minute. Anthers exserted, somewhat acute  $\frac{2}{3}$ -line long. Style very slightly puberulous, capillary, about 3 lines long. Stigmatic lobes very minute. Ovary attenuated upwards. Capsule clavate about  $\frac{1}{2}$  in. long.

Hab.: Endeavour River, *Perseitz* (*F. v. M.*); Eumundi, *J. F. Bailey* and *J. H. Simmonds*.

5. **J. eranthemoides** (Eranthemum-like), *F. v. M. Fragm.* vi. 90; *Benth. Fl. Austr.* iv. 551. Branches, veins of the under side of the leaves and inflorescence pubescent. Leaves petiolate, ovate-lanceolate or lanceolate, 2 to 2½ in. long. Flowers white, in terminal dichotomous corymbose panicles as long as the leaves. Bracts small, linear-subulate. Pedicels very short, without bracteoles. Calyx-segments linear-setaceous, about 2 lines long. Corolla 5 or 6 lines long, the tube nearly straight, dilated upwards; lips rather shorter than the tube, the upper one narrow, erect, notched, innermost in the bud, lower lip broader, with the prominent longitudinal fold of the genus, 3 lobed to the middle, the middle lobe broader than the others and overlapping them in the bud. Anther-cells inserted one higher than the other as in the rest of the genus, but the lower one without any basal appendage. Capsule narrow, 5 or 6 lines long, contracted flattened and seedless at the base. Seeds 2 in each cell.

Hab.: Tweed River, *C. Moore*.

Described from a single small specimen in Herb. F. Mueller, very different from any species known to me, especially in inflorescence, which, however, comes nearest to that of the section *Rhaphidospora*.—*Benth.*





2. **G. Earlii** (after G. W. Earl), *F. v. M. Fragm.* vi. 87. *Benth. Fl. Austr.* iv. 551. A beautiful glabrous shrub or tree of 10 to 25ft. Leaves oblong-elliptical, acute or mucronulate, entire or with a few very small acute teeth,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long. Flowers of a rich red, solitary in the axils or in clusters of very few. Pedicels 2 to 3 lines long, with minute bracts and bracteoles at the base. Calyx-segments narrow, acute, about 2 lines long. Corolla-tube incurved, much shorter than the tube, the lower lip rather shorter, equally divided into rather broad almost acute lobes. Filaments hairy at the base; staminodia filiform. Capsule hard, almost woody, about  $\frac{3}{4}$  in. long.—*Earlia excelsa*, *F. v. M. Fragm.* iii. 160.; *Thyrsacanthus Earlia*, *F. v. M. Fragm.* vi. 87.

Hab.: Near Rockhampton, *Dallachy, Thozet.*

*Thyrsacanthus* is a South American genus with a very different habit and corolla.—*Benth.*

Wood flesh-coloured, becoming brown towards the centre; very hard, tough, and close grained.—*Bailey's Cat. Ql. Woods*, No. 293.

3. **G. ilicifolium** (Holly-leaved), *F. v. M. Herb.*, *Benth. Fl. Austr.* iv. 552. A glabrous shrub of 10 to 15ft. (*Nerst.*). Leaves very shortly petiolate, broadly ovate, obtuse or acute, bordered by irregular mucronate or prickly teeth, 3 to 4 in. long, coriaceous, much veined but very shining. Flowers of a rich red, in short dense axillary clusters or racemes. Pedicels short, with very small bracts and bracteoles at the base. Calyx-segments 3 to 4 lines long. Corolla-tube  $\frac{3}{4}$  in. long, dilated into a broad throat but not so oblique nor so broad as in *G. Earlii*, the lips  $\frac{1}{2}$  in. long, the upper one concave and incurved, the lower one divided to the base into 3 equal narrow lobes. Stamens as in *G. Earlii*. Capsule above 1 in. long.

Hab.: Mount Blackwood, Mackay district, *Nerst.*

Near *G. pictum*, of which it has the narrow-lobed corollas, and only differs, as far as I can ascertain, in foliage.

## ORDER XCIV. MYOPORINEÆ.

Flowers irregular or rarely nearly regular. Calyx persistent, more or less deeply toothed or divided into 5, rarely 4, lobes or segments. Corolla with 4 or 5, rarely more, lobes more or less 2-lipped or nearly equal, imbricate in the bud, the upper lip or lobes outside (or rarely inside?). Stamens usually 4, in pairs, inserted in the tube of the corolla and alternating with its lower lobes, rarely nearly equal and as many as corolla-lobes; anther-cells opening longitudinally, at first nearly parallel, confluent at the apex, and usually when open forming a single reniform cell. Ovary free, not lobed, normally 2-celled, with 2 collateral ovules, or 2 or 3 superposed pairs of collateral ovules in each cell, attached to the incurved margins of a placenta projecting from the dissepiment so as to divide each cell more or less perfectly into 2, with one of the ovules of each pair in each half-cell, or sometimes the ovary divided from the first into 2 to 4, or in extra-Australian species more, cells with one ovule in each cell. Ovules pendulous, anatropous, with a superior micropyle. Style simple, undivided, or obscurely notched at the apex. Fruit a dry or succulent drupe, the endocarp 2- to 4- or rarely more-celled or 1-celled by abortion, or separating into as many pyrenes. Seeds usually solitary in each cell or half-cell, very rarely 2 or 3 superposed, albuminous in the species where they have been seen ripe, but the albumen sometimes thin; embryo straight, with a superior radicle.—Shrubs or small trees. Leaves alternate, scattered, or rarely strictly opposite, undivided. Flowers axillary, solitary, or in clusters of 2, 3, or more. Bracts at the base of the pedicels very small or none, no bracteoles on the pedicels.

The Order is chiefly Australian, and two genera entirely so; a third extends sparingly over the Indian Archipelago, the Pacific Islands, and tropical Africa; and there is a fourth monotypic tropical American genus. The affinity of this Order with Verbenaceæ is so striking that some

have proposed uniting the two, but the superior radicle has, on examination, proved so constant a distinction, that I have followed Brown and others in maintaining the two as separate Orders. The three genera, very distinct as to the majority of their species, run so much into one another, through intermediate species with the characters differently combined, that it is impossible to ascribe to them any absolute limits.—*Benth.*

- Corolla usually campanulate, nearly regular, rarely shortly cylindrical at the base. Ovary usually 2 to 4 or more celled, with 1 ovule in each cell, rarely 2-celled with 2 ovules in each cell . . . . . 1. MYOPORUM.  
Corolla usually tubular at the base, with a more or less irregular limb. Ovary 2-celled, with 2 or rarely 1 ovule in each cell . . . . . 2. PHOLIDIA.  
Corolla usually tubular at the base, with a more or less irregular limb. Ovary 2-celled, with 2 or 3 superposed pairs, or rarely 1 pair only of ovules in each cell . . . . . 3. EREMOPHILA.

### 1. MYOPORUM, Banks and Soland.

(*Myo*, to shut; and *poros*, a pore.)

(Polycælium and Disoon, DC.)

Calyx divided to the middle or nearly to the base into 5 lobes or segments not enlarged after flowering. Corolla-tube usually short and almost campanulate or shortly cylindrical at the base, lobes 5, nearly equal and regular, or the lowest rather larger. Stamens 4, alternating with the lower lobes, or rarely 5, all nearly equal, and scarcely protruding or shortly exerted. Ovary 2- to 4-celled, or in species not Australian 5- or 6-celled, with 1 ovule in each cell, or rarely 2-celled with 2 ovules in each cell. Drupe usually small, but more or less succulent.—Trees, shrubs or prostrate plants. Leaves alternate or rarely opposite, entire or toothed. Pedicels axillary, usually clustered. Flowers small, mostly white.

The genus is also represented by a few species in the Indian Archipelago and the Pacific islands, and by one species in tropical Africa.

SECT. I.—**Eumyoporum**.—Calyx small, narrow. Ovary 2 to 4-celled, with 1 ovule in each cell. Fruit globular or ovoid, not compressed.

- Erect or divaricate shrubs. Corolla more or less bearded inside, or rarely quite glabrous, lobes usually shorter than the tube. Perfect stamens 4. Leaves acute or acuminate, entire or very rarely slightly serrate. . . . . 1. *M. acuminatum*.  
Erect shrubs. Leaves lanceolate or linear, entire. Corolla not bearded at the throat. Stamens 5.  
Corolla 2 to 3 lines long. Fruit 2-celled. . . . . 2. *M. deserti*.  
Corolla 4 to 5 lines long. Fruit 4-celled . . . . . 3. *M. laxiflorum*.

SECT. II.—**Disoon**.—Calyx small, narrow. Ovary 2-celled, with 1 ovule in each cell. Fruit compressed.

Fruit very flat, acute (about 3 lines long).

- Leaves linear-lanceolate, acute, entire or scarcely toothed,  $1\frac{1}{2}$  to 3 in. long 4. *M. platycarpum*.

SECT. III.—**Chamæpogonia**.—Calyx-segments herbaceous. Ovary 2 celled, with 2 ovules in each cell. Fruit somewhat compressed.

- Calyx-segments 2 to 4-lines long . . . . . 5. *M. debile*.

1. ***M. acuminatum*** (pointed leaves), *R. Br. Prod.* 515, *Benth. Fl. Austr.* v. 3. “Mee-Mee,” Stradbroke, *Watkins*. An erect glabrous shrub, exceedingly variable in stature, breadth of leaves, and size of flowers. Leaves alternate, in the common forms varying from elliptical-oblong, to lanceolate or linear, more or less acuminate, much contracted towards the base, quite entire, and  $1\frac{1}{2}$  to 3 in. long, but sometimes the broader ones almost obovate and rather obtuse, or all smaller, or very rarely a few of the leaves marked here and there with a few distant teeth. Pedicels 2 to 4 lines long, in axillary clusters of 2 to 4 or rather more, or rarely solitary. Calyx-tube very short, segments narrow, acute, rather rigid, rarely above 1 line long. Corolla almost campanulate, about 3 to 4 lines long, the lobes nearly equal, spreading, rather shorter, or sometimes much

shorter than the tube, more or less bearded inside as well as the tube, the hairs sometimes almost disappearing from the lobes. Stamens 4 without any rudiment of the fifth in the numerous flowers examined, although such a rudiment has been observed by others; anthers very shortly protruding. Ovary most frequently 4-celled, but occasionally with only 3 or 5 cells and ovules. Drupe nearly globular, 2 to 3 lines diameter, or rarely larger.

Hab.: Common along the coast from Cape Upstart, *M'Gillivray*, to Moreton Bay, *A. Cunningham* and others.

This truly polymorphous species has been subdivided into several races, or supposed species, of which the following are the most marked:—

1. *ellipticum*. Leaves rather broad and scarcely acuminate. Flowers moderate-sized.—*M. ellipticum*, R. Br. Prod. 515; A. DC. Prod. xi. 707.

2. *acuminatum*. Leaves rather broad, acuminate, mostly 3 to 4 in. long. Flowers larger than in *M. ellipticum*.—*M. acuminatum*, R. Br. Prod. 515; A. DC. Prod. xi. 707.—Barnard and Frankland islands, *M'Gillivray*; Brisbane river, Moreton Bay, *F. v. Mueller* and others; *F. v. M. Myop.* t. 71; *Pogonia glabra*, Andr. Bot. Rep. t. 283; *Andreusia glabra*, Vent. Jard. Malm. t. 108, although figured with 5 equal stamens, is probably this form.

Wood of a light colour, firm and easily worked.—*Bailey's Cat. Ql. Woods.* No. 295.

3. *parviflorum*. Leaves of the typical form, or rather smaller and narrow. Flowers smaller, the beard of the corolla copious or rare, or sometimes none at all.—*M. tenuifolium* R. Br. Prod. 515; Keppel and Shoalwater Bays, etc., *R. Brown*; islands of the coast, *M'Gillivray*, *F. v. Mueller* and others; Rockingham Bay and Rockhampton, *Dallachy* and others; Moreton Bay and other parts of the coast, *A. Cunningham*.

4. *angustifolium*. Leaves narrow-lanceolate or almost linear, but on longer petioles and more acute than in *M. deserti*, the lobes of the corolla sometimes almost, or even quite glabrous, but often much bearded, and the upper stamen wanting (or small and abortive?)—*M. montanum*, R. Br. Prod. 515; A. DC. Prod. xi. 708; *M. Cunninghamii*, Benth in Hueg. Enum. 78; A. DC. l.c. 707; *M. cyanantherum* and *M. Dampieri*, A. Cunn. in A. DC. l.c. 708, *F. v. M. Myop.* t. 69. Chiefly in the interior to Cooper's Creek.

Has been suspected of causing the death of sheep.

2. ***M. deserti*** (a desert shrub), *A. Cunn.*; *Benth. in Hueg. Enum.* 73, *Benth. Fl. Austr.* v. 5. An erect, glabrous shrub, nearly resembling the narrow-leaved varieties of *M. acuminatum*, but the leaves still narrower, linear or linear-lanceolate, acute or almost obtuse, entire, rather thick, 1 to 2 in. long. and narrowed into a very short petiole. Pedicels often several together, rather thick, and almost always remarkably recurved. Calyx and corolla about the size of the smaller-flowered varieties of *M. acuminatum*, but the corolla very regular, without any or with scarcely any hairs in the throat. Stamens 5, all equal, the anthers not exerted. Ovary 2-celled or very rarely 3-celled, with 1 ovule in each cell. Fruit ovoid 2 to 3 lines long, not compressed, usually with 2 cells and seeds.—A. DC. Prod. xi. 707; *F. v. M. Myop.* Pl. t. 68; *M. strictum* and *M. patens*, A. Cunn. in A. DC. Prod. xi. 708; *M. dulce*, Benth. in Mitch. Trop. Austr. 334; *M. rugulosum*, *F. v. M.* in Linnææ, xxv. 427.

Hab.: Burdekin river, *F. v. Mueller*; Belyando and Balonne rivers, *Mitchell*; Nerkool Creek *Bowman*; Darling Downs, *Lau*.

Considered poisonous to stock; there are many instances recorded where the losses have amounted to some thousands.

3. ***M. laxiflorum*** (loose flowers), *Benth. Fl. Austr.* v. 6. An erect shrub, closely allied to *M. deserti*, with the foliage and habit of the broader leaved forms of that species, differing chiefly in the larger flowers. Leaves narrow-lanceolate, acute, contracted into a short petiole. Pedicels solitary or 2 or 3 together, often  $\frac{1}{2}$  in. long. Calyx-lobes rather longer than in *M. deserti*. Corolla fully 5 lines long, the lobes bearded inside at the base or nearly glabrous. Stamens 5, all equal, included in the tube. Ovary 2-celled, with one ovule in each cell. Drupe succulent, with a hard putamen, not compressed.—*F. v. M. Myop.* Pl. t. 67; *Eremophila Myoporoides*, *F. v. M. Fragm.* v. 23.

Hab.: Cape river, *Bowman*; Rockhampton, *Thozet*.

4. **M. platycarpum** (broad fruit), *R. Br. Prod.* 516; *Benth. Fl. Austr.* v. 7. A tall shrub, or small tree, quite glabrous. Leaves linear-lanceolate, acute, entire, or with a few small distant teeth in the upper part,  $1\frac{1}{2}$  to 3 in. long, rather thick, contracted into a short petiole. Pedicels often 6 or more in the axils, 1 to 2 lines long. Calyx not  $\frac{3}{4}$  line long, acutely lobed. Corolla more or less bearded inside at the throat, sometimes scarcely 2 lines long with the stamens included, in other specimens twice as large with exserted stamens. Ovary 2-celled, with 1 ovule in each cell. Fruit ovate or ovate-oblong, acute, much flattened, about 3 lines long.—A. DC. *Prod.* xi. 711; F. v. M. *Myop.* Pl. t. 60.

Hab.: Inland localities.

From 20 grams of resin Dr. Lauterer obtained 2·4 grams of picric acid.

5. **M. debile** (weak), *R. Br. Prod.* 516; *Benth. Fl. Austr.* v. 8; "Amulla," Rockhampton, *Thozet*. A low glabrous shrub, with a thick stock and decumbent or ascending stems, attaining sometimes 2 ft. or more, the branches often glandular-tuberculate. Leaves alternate, very shortly petiolate, or nearly sessile, elliptical oblong or lanceolate, entire or with a few small distant acute teeth, and often one or two larger ones on each side near the base,  $1\frac{1}{2}$  to 3 or even 4 in. long. Pedicels solitary in the axils or in pairs, rarely so long as the calyx. Calyx-segments linear but leaf-like, acute, 3 to 4 lines long. Corolla pink or purplish, the tube about as long as the calyx, the lobes not half so long, more or less bearded inside at the base. Stamens included in the tube. Ovary 2-celled, with 2 collateral ovules in each cell. Fruit ovoid, somewhat compressed, 3 to 4 lines long, often furrowed on each side, 2-celled. Seeds either 2 in each cell more or less separated by an imperfect dissepiment, or more frequently solitary by the abortion of the other ovule.—Bot. Mag. t. 1830, A. DC. *Prod.* xi. 711; F. v. M. *Myop.* Pl. t. 61; *Pogonia debilis*, Andr. Bot. Rep. t. 212; *Andreusia debilis*, Vent. Jard. Malm. under n. 108; *Myoporum diffusum*, R. Br. *Prod.* 516, A. DC. *Prod.* xi. 711; *Capraria calycina*, A. Gray, in Proc. Amer. Acad. vi. 49; *Benth. Fl. Austr.* above, iv. 503.

Hab.: Keppel and Shoalwater Bays and Broadsound, *R. Brown*; Dawson river, Brisbane river, Moreton Bay, *F. v. Mueller*; Rockhampton, *Dallachy* and others; Nekool Creek, Connor's river, *Boorman*; Darling Downs, *Lau*.

Has been suspected of poisonous qualities.

## 2. PHOLIDIA, R. Br.

(Pseudopholidia, A. DC.; Sentic, Duttonia and Pholidiopsis, F. v. M.)

Calyx divided to the base, with 5 or rarely 4 segments, often unequal, somewhat dilated and much imbricate at the base, acuminate, not enlarged after flowering. Corolla-tube shortly cylindrical at the base, expanded into an obliquely campanulate throat, the limb of five spreading lobes, not very unequal, the 2 upper ones usually rather more united. Stamens 4, didynamous, usually exserted from the corolla-tube, but shorter than the lobes. Ovary 2-celled, with 2 ovules, or very rarely only 1 in each cell; style usually longer than in *Myoporum*, and hooked at the end. Fruit a dry or rarely succulent drupe, 2-celled, or more or less perfectly 4-celled, with 1 seed in each cell.—Shrubs. Leaves alternate scattered or irregularly opposite, entire or toothed. Flowers axillary, solitary and sessile, or on very short pedicels (except in *P. santalina*).

The genus is limited to Australia. In the typical forms it differs from *Myoporum* in the more perfectly divided calyx, the shape of the corolla, the more didynamous stamens, as well as in the ovary and fruit and inflorescence, but *Myoporum debile* has the ovary of *Pholidia*. From *Eremophila*, *Pholidia* differs in the more regular corolla, the calyx-segments never enlarged after flowering, the stamens not exserted, the ovules never superposed in each half cell, and the fruit not separating into 1-seeded nuts as in the section *Eremocosmos*, nor so succulent as in *Stenochilus*, but none of the latter characters are constant through all the species of *Eremophila*, and the fruits of some species are as yet unknown. The distinction between *Pholidia* and *Eremophila* is not, therefore, more definite than that between *Pholidia* and *Myoporum*.—*Benth.*

Leaves opposite, narrow-linear,  $\frac{3}{4}$  to 1 in. long, almost scaly, recurved at the end.

Leaves alternate, linear, entire. Branches divaricate, often spinescent. Fruit beaked.

Leaves alternate, narrow-lanceolate, above 1 in. long. Pedicels about  $\frac{1}{2}$  in. long.

1. *P. Dalyana*.

2. *P. divaricata*.

3. *P. santalina*.

1. **P. Dalyana** (after Sir D. Daly), *F. v. M., Benth. Fl. Austr.* v. 10. Branches minutely tuberculose. Leaves narrow-linear, with an acute recurved apex, usually  $\frac{3}{4}$  to 1 in. long. Flowers yellowish, solitary in the axils, on pedicels of 3 to 4 lines. Calyx-segments about 1 line long. Corolla about 1 in. long, lobes pubescent on the upper part. Filaments glabrous. Ovary densely villous. Fruit conical, 4-celled.—*Eremophila Dalyana*, *F. v. M. Fragm.* v. 22; *Myop. Pl.* t. 41.

Hab.: Towards Cooper's Creek.

2. **P. divaricata** (divaricate), *F. v. M. in Hook. Kew Journ.* viii. 201, and *Trans. Phil. Soc. Vict.* i. 47; *Benth. Fl. Austr.* v. 14. An erect shrub of several feet, with divaricate branches, sometimes spinescent and quite glabrous, or with a line of short hairs above each leaf. Leaves linear or linear-cuneate, obtuse, narrowed at the base, rarely above  $\frac{1}{2}$  inch long and often smaller, usually drying black. Flowers purple or white, often spotted, solitary and nearly sessile in the axils. Calyx-segments 4 or 5, broad at the base, acuminate, slightly pubescent or ciliate, about 2 to  $2\frac{1}{2}$  lines long. Corolla densely stellate-pubescent outside, under  $\frac{1}{2}$  in. long, the cylindrical base shorter than the calyx, the throat obliquely campanulate, the middle lower lobe rather larger and broader than the others and very hairy inside, the hairs continued to the base of the tube as in most *Pholidias*, the 2 upper lobes shortly united. Filaments hairy at the base. Ovary glabrous, 2-celled, with 2 ovules in each cell. Ripe fruit ovoid at the base, tapering into a beak, the whole about 4 lines long, more or less perfectly 4-celled, with 1 seed in each cell. *Sentis rhynchocarpa*, *F. v. M. Fragm.* iv. 48, vi. 150; *Eremophila divaricata*, *F. v. M. in Trans. R. Soc. Tasm.* iii. 293; *Myop. Pl.* t. 55.

Hab.: Inland southern localities.

3. **P. santalina** (like a Santalum), *F. v. M.; Benth. Fl. Austr.* v. 15. An erect glabrous shrub of several feet, slightly glandular-verrucose. Leaves narrow lanceolate, acuminate, entire, narrowed into a rather long petiole, rather thick  $1\frac{1}{2}$  to 2 in. long. Flowers white, solitary in the axils, on pedicels usually of about  $\frac{1}{2}$  in., thickened under the flower. Calyx-segments narrow, acuminate, not 2 lines long, imbricate at the base. Corolla-tube with the cylindrical part nearly as long as the calyx, the upper part broad, about 3 lines long, glabrous inside or nearly so, the lobes scarcely 2 lines long, the 4 upper ones ovate, spreading, with short recurved points or almost obtuse, the 2 uppermost of them ascending, the middle lower lobe twice as broad as the others. Stamens included, didynamous. Ovary glabrous, 2-celled, with 2 ovules in each cell. Drupe succulent, the putamen more or less perfectly 4-celled, with 1 seed in each cell, or more frequently reduced by abortion to 1 or 2 cells and seeds.—*Pholidiopsis santalina*, *F. v. M. in Linnæa*, xxv. 429; *Eremophila santalina*, *F. v. M. in Proc. R. Soc. Tasm.* iii. 295; *Myop. Pl.* t. 54.

Hab.: Cape York Peninsula.

This species differs from all others of the genus in its elongated pedicels, like those of *Myoporum*; they are, however, solitary, and the calyx, corolla, and ovary are those of *Pholidia* rather than of *Myoporum* or *Eremophila*.—*Benth.*

Wood of a light-brown colour, grain close.—*Bailey's Cat. Ql. Woods* No. 295 Bis.

## 3. EREMOPHILA, R. Br.

(Desert shrubs).

(Stenochilus, R. Br.; Eremodendron, DC.)

Calyx divided to the base into 5 segments or rarely 5-lobed, often but not always enlarged after flowering. Corolla-tube usually broad from the base or constricted above the ovary, more or less elongated and incurved, very rarely with the cylindrical base of *Pholidia*, the limb oblique or 2-lipped, 5-lobed. Stamens 4, didynamous, often exserted. Ovary 2-celled, with 2 or 3 superposed pairs of ovules in each cell, of which, however, the lower pairs remain usually unfecundated, or in a very few species only one pair in each cell at the time of flowering. Style filiform. Fruit, where known, a dry or succulent drupe, the putamens separating into 4 1-seeded pyrenes, or 4-celled with one seed in each cell, or fewer cells and seeds by abortion.—Shrubs. Leaves alternate or scattered. Flowers solitary, or in a few species several together in the axils, usually pedicellate, without bracts.

The genus is limited to Australia. As will be seen by the above character, there is no positive combination of characters to separate it from *Pholidia*, being connected with that genus, as *Pholidia* is with *Myoporum*, by exceptional species. The habit is, however, different, and there are always either the superposed ovules or the enlarged fruiting calyx, and often the succulent fruit, to distinguish *Eremophila*.

**SECT. I. Eriocalyx.**—*Calyx-segments not overlapping, thick and soft, densely tomentose, not becoming scarious after flowering. Ovary with two pairs of ovules in each cell.*

Flowers nearly sessile. Leaves orbicular to lanceolate, short, pubescent or tomentose.

Corolla and ovary glabrous, lobes obtuse. Stamens included . . . 1. *E. Bowmanii*.  
Corolla pubescent outside, style glabrous . . . 2. *E. stronglylophylla*.

**SECT. II. Eremocosmos.**—*Calyx-segments not at all or scarcely overlapping at the base, more or less enlarged, veined, and scarious after flowering. Ovary with 2 to 4 pairs of ovules in each cell. Fruit (where known) dry, the endocarp separating into distinct pyrenes.*

Enlarged calyx-segments more or less cuneate and obtuse.

Leaves linear or linear-lanceolate. Corolla lobes obtuse. Stamens included or shortly exserted.

Ovary very woolly, with 2 to 4 pair of ovules to each cell,

Leaves narrow, linear . . . 3. *E. Sturtii*.  
Leaves linear-lanceolate . . . 4. *E. Mitchellii*.

Enlarged calyx-segments oblong or lanceolate, acute. Leaves linear or linear-lanceolate.

Corolla upper lobes rather acute. Stamens exserted . . . 5. *E. Latrobei*.

**SECT. III. Platycalyx.**—*Calyx campanulate, 5-lobed. Flowers and fruit of Platychilus. Single species . . . 6. E. Macdonellii.*

**SECT. IV. Platychilus.**—*Calyx-segments much imbricate at the base, the outer ones usually broader. Corolla-lobes all broad and obtuse, or the upper ones scarcely acute. Stamens included or scarcely exserted. Ovules in 2 or 3 pairs in each cell. Fruit of Stenochilus*

Calyx-segments small or narrow and acute, not enlarged after flowering.

Corolla tube much enlarged upwards. Leaves long, linear or lanceolate . . . 7. *E. longifolia*.

Calyx-segments ovate or lanceolate, acute, not exceeding 3 lines in flower, nor much enlarged afterwards. Plants very glabrous, often drying blue.

Very divaricately branched. Leaves narrow-linear. Corolla-tube very broad and enlarged from the base . . . 8. *E. polyclada*.

Moderately spreading. Leaves lanceolate or linear-lanceolate, usually long. Corolla-tube broad and enlarged from the base . . . 9. *E. bignoniiflora*.

Calyx-segments lanceolate or the outer ones ovate, 3 to 6 lines long. Plant hoary-tomentose or at length glabrous . . . 10. *E. Freelingii*.

Calyx-segments broad-lanceolate, 4 to 6 lines long, more or less hirsute.

Leaves linear-lanceolate . . . . . 11. *E. Goodwinii*.

Leaves obovate or oblong, serrulate . . . . . 12. *E. Willsii*.

SECT. V. **Stenochilus**.—*Calyx-segments imbricate at the base, usually enlarged after flowering. Corolla 4-upper lobes short and acute, the fifth lowest more deeply separated and sometimes narrow. Stamens exserted. Ovules 2 or 3 pairs, or rarely only 1 pair in each cell. Drupe succulent, with a thick bony putamen not separating into nuts.*

Peduncles usually shorter than the calyx, not flexuose.

Calyx-segments lanceolate, small in flower and not much enlarged afterwards.

Leaves linear or lanceolate, hoary tomentose or at length glabrous . . 13. *E. Brownii*.

Peduncles longer than the calyx, very spreading, usually flexuose.

Leaves narrow-lanceolate, entire. Ovules, 2 pairs in each cell.

Lowest corolla-lobe obtuse. Calyx much enlarged after flowering . . 14. *E. Duttonii*.

Lowest corolla-lobe acute. Calyx-segments acute scarcely enlarged, after flowering . . . . . 15. *E. maculata*.

1. **E. Bowmanii** (after Edward Bowman), *F. v. M. Fragm.* ii. 139; *Benth. Fl. Austr.* v. 18. Densely clothed with a white or hoary tomentum, either short and close or looser and plumose. Leaves oblong or lanceolate, obtuse, rather thick, entire, contracted at the base but scarcely petiolate, tomentose on both sides, the midrib prominent undeneath, under  $\frac{1}{2}$  in. long when broad, nearly 1 in. when narrow. Flowers blue, solitary, on pedicels of 3 to 6 lines. Calyx-segments 5 to 7 lines long, oblong-linear, rather obtuse, tomentose on both sides, rather unequal, but scarcely imbricate. Corolla glabrous outside, about 1 in. long, the tube slightly contracted above the ovary, then broad, the lobes broad and obtuse, the middle lower one rather narrower than the others. Stamens included. Ovary glabrous, narrow, with 2 pairs of ovules to each cell. Fruit pointed, the lower half ribbed, upper part smooth.—*F. v. M. Myop. Pl. t.* 18.

Hab.: Southern inland localities.

2. **E. stronglylophylla** (round-leaved), *F. v. M. Fragm.* x. 87, and *Myop. Pl. t.* 23. Plant hoary-tomentose, sprinkled with articulate hairs. Leaves orbicular, mostly between 4 and 8 lines, entire, on short broad petioles. Flowers almost sessile. Calyx 4 to 6 lines long, segments linear-lanceolate acute, pubescent towards the top inside. Corolla about  $\frac{3}{4}$  in. long, almost violet, pubescent outside, and woolly-bearded at the throat, lateral-lobes ovate, middle-lobe rotund, the upper ones almost deltoid. Stamens included. Style glabrous. The young fruit hairy, oval, crowned by the long flexuose style.

Hab.: Recorded for Queensland by *F. v. Mueller*.

3. **E. Sturtii** (after Capt. Charles Sturt), *R. Br. App. Sturt. Exped.* 22; *Benth. Fl. Austr.* v. 21. An erect very much branched strong-scented and viscid shrub or small tree, glabrous or very minutely hoary-pubescent. Leaves narrow linear, usually ending in a hooked point, entire, contracted at the base and often petiolate, rarely above 1 in. long. Flowers purplish, numerous but solitary in each axil, on pedicels of 3 to 4 lines. Calyx-segments obovate or oblong, membranous and rather rigid, obtuse, coloured and veined, rather variable in shape and size but usually attaining 4 or 5 lines when the flowering is over. Corolla pubescent, about  $\frac{1}{2}$  in. long, the narrow base of the tube short, the upper part broadly campanulate, bearded inside, the 4 upper lobes short broad and obtuse, the 2 uppermost more united than the others, the middle lowest lobe larger and broader than the others, notched or 2-lobed and woolly inside. Stamens included. Ovary very villous with 2 or 3 pairs of ovules to each cell. Fruit like that of *E. Mitchellii* but not so acuminate.—*F. v. M.* in *Proc. R. Soc. Tasm.* iii. 294 and *Rep. Babb. Exp.* 17; *Myop. Pl. t.* 27.

Hab.: Cunnamulla and other southern inland localities towards Cooper's Creek.

Wood of a grey colour, scentless, hard, close-grained and nicely marked.—*Bailey's Cat. Ql. Woods*, No. 295a.

The species scarcely differs from *E. Mitchellii*, except in its smaller flower and narrower leaves and scentless wood.

4. ***E. Mitchellii*** (after Sir Thos. Mitchell), *Benth. in Mitch. Trop. Austr.* 31, *Fl. Austr.* v. 21. Scented Sandalwood. A tall shrub or small tree of 10 to 30 ft., glabrous viscid and strongly-scented. Leaves linear-lanceolate, obtuse or with a hooked point, entire, contracted into a petiole, 1-nerved, 1 to 2 in. long. Flowers solitary in the axils, on pedicels of 3 to 4 lines. Calyx-segments oblong or cuneate-oblong, obtuse, membranous, veined, glabrous or pubescent on the edges, 4 to 5 lines long. Corolla about  $\frac{3}{4}$  in. long, the cylindrical part of the tube about 2 lines, the broad part above twice as long, the middle lower lobe broader than the others, shortly 2-lobed, woolly inside. Stamens shorter than the corolla. Ovary very woolly, with 3 or 4 superposed pairs of ovules in each cell. Fruit ovoid, almost acuminate, half as long as the calyx, the exocarp thin and membranous, the endocarp separating into 4 nuts each with 1 or with 2 superposed seeds.—*F. v. M. in Proc. R. Soc. Tasm.* iii. 294, *Rep. Babb. Exped.* 17, and *Myop. Pl.* t. 25.

Hab.: Elevated stony lands on the Bogan, Narran, Maranoa, Belyando, &c., *Mitchell*; Port Denison, *Fitzalan*, *Dallachy*; Rockhampton, *Thozet and others*; Suttor River, *Fitzalan*, *Sutherland*; Armadilla, *Barton*; Darling Downs, *Lau*.

Wood for a short distance in from the bark white, all the rest of a brown colour, hard and close in grain, prettily marked and fragrant; useful for cabinet work.—*Bailey's Cat. Ql. Woods*, No. 296.

5. ***E. Latrobei*** (after ex-Governor Latrobe of Vict.), *F. v. M. in Proc. R. Soc. Tasm.* iii. 294, *Rep. Babb. Exped.* 17, and *Fragm.* i. 125, t. 8; *Benth. Fl. Austr.* v. 22. An erect much-branched shrub, attaining 10 ft., more or less clothed with a close hoary minutely stellate tomentum, rarely almost glabrous, usually also glandular-tuberculate. Leaves linear or narrow-lanceolate, flat or with recurved margins, obtuse or rarely acute, entire, contracted into a short petiole,  $\frac{1}{2}$  to 1 in. long or rather more. Pedicels solitary, rarely exceeding  $\frac{1}{4}$  in. Calyx-segments lanceolate, acute, nor at all or scarcely overlapping at the base, under  $\frac{1}{2}$  in. long when in flower, attaining sometimes  $\frac{3}{4}$  in. in fruit. Corolla about 1 in. long spotted, glabrous outside, the tube broad incurved not contracted above the ovary, the lobes almost acute, the 4 upper ones erect and nearly equal, the lowest often shorter and separated to near the middle of the corolla. Stamens exerted. Ovary glabrous, narrow-conical, with 2 pairs of ovules to each cell. Drupe nearly dry, ovoid-conical, 4 to 5 lines long, readily splitting into 2 or 4 at the top, the endocarp sometimes readily separating into 4 nuts.—*F. v. M. Myop. Pl.* t. 31; *E. tuberculata*, *F. v. M. in Proc. R. Soc. Tasm.* iii. 294.

Hab.: Cunnamulla, *Dr. T. L. Baneroff*; Georgina River, *Bailey*; Suttor, Burdekin and Mackenzie Rivers, *F. v. Mueller*.

The corolla approaches that of *Stenochilus*, but the calyx and fruit are those of *Eremocosmos*.—*Benth.*

6. ***E. Macdonnellii*** (after Sir Richard G. Macdonnell, an ex-Governor of S.A.), *F. v. M. Rep. Babb. Exped.* 18, *Benth. Fl. Austr.* v. 22. A branching shrub apparently diffuse, sometimes quite glabrous, more frequently clothed with a hoary or white close stellate or plumose tomentum, or with long spreading hairs, or with both. Leaves oblong-linear or lanceolate, obtuse or acute, contracted at the base but scarcely petiolate, rarely above  $\frac{1}{2}$  in. long. Pedicels solitary,  $\frac{1}{4}$  to above  $\frac{1}{2}$  in. long. Calyx campanulate, with acute or acuminate lobes about as long as the tube, which is sometimes prominently angled and membranous, sometimes more herbaceous and tomentose without prominent ribs, the whole calyx varying from 4 to 8 or even 9 lines long. Corolla bluish, glabrous outside, 1 to  $1\frac{1}{2}$  in. long, the tube not constricted above the ovary and much dilated



upwards, the lobes all broad and nearly  $\frac{1}{2}$  in. long, the upper ones more united, the three lower more spreading, the lowest rather broader than the others but not notched. Stamens included. Ovary narrow, glandular-dotted and tipped with a few hairs, with 2 pairs of ovules in each cell. Fruit very succulent, ovoid acute, twice as long as the enlarged calyx.—F. v. M. Myop. Pl. t. 1.

Hab.: Towards Cooper's Creek; Bulloo and Diamantina, *Dr. T. L. Bancroft*.  
The calyx of this species is exceptional in the whole Order of Myoporinæ.

7. **E. longifolia** (long leaved), *F. v. M. in Proc. R. Soc. Tasm.* iii. 295; *Benth. Fl. Austr.* v. 23. A tall erect shrub, the young shoots minutely hoary-tomentose, the older foliage nearly glabrous and often drying black. Leaves scattered, linear or almost linear-lanceolate, obtuse or tapering into a recurved point, rather thick but flat, 2 to 4 or even 5 in. long, contracted into a short petiole. Pedicels solitary or 2 together, varying in length from 2 or 3 lines to  $\frac{1}{2}$  in., stout or slender, erect or spreading. Calyx-segments triangular or lanceolate, acute or acuminate, rarely 2 lines long, united at the base and scarcely overlapping, usually woolly-ciliate on the margins. Corolla velvety pubescent outside,  $\frac{3}{4}$  to 1 in. long, the tube gibbous at the base, contracted over the ovary, the remainder much dilated and slightly incurved, the lobes all ovate and obtuse the two uppermost rather smaller and the lowest often but not always more deeply separated than the others. Stamens shortly exerted. Ovary thick and fleshy, with 2 pairs of ovules in each cell. Fruit ovoid or globular, very succulent, with a thick hard putamen, completely 4-celled and not separating into pyrenes.—F. v. M. Myop. Pl. t. 13; *Stenochilus longifolius*, R. Br. Prod. 517 and App. Sturt. Exped. 23; A. DC. Prod. xi. 714; *S. salicinus*, Benth. in Mitch. Trop. Austr. 251 and *S. pubiflorus*, Benth. l. c. 273.

Hab.: Suttor River, *F. v. Mueller, Bowman* (the latter with smaller flowers and fruit), *Sutherland*; Belyando River, *Mitchell*; Armadilla, *Barton*; Darling Downs, *Lau*.

8. **E. polyclada** (much branched), *F. v. M. in Proc. R. Soc. Tasm.* iii. 294, *Benth. Fl. Austr.* v. 24. A glabrous shrub of 4 to 8 feet, with very divaricate rigid intricate branches, the smaller ones almost spinescent, the specimens usually drying black. Leaves mostly very spreading, distant, linear or narrowly linear-lanceolate, acute, entire, narrowed at the base, 1 to 2 in. long. Pedicels solitary, often recurved, 2 to 4 lines long. Calyx-segments much imbricate, broad, obtuse, or acuminate, with spreading or recurved points. Corolla glabrous outside,  $\frac{3}{4}$  to 1 in. long, the tube broad, almost campanulate, gradually enlarged from the base and not contracted above the ovary, the lobes all very broad, the 2 upper ones more united and the middle lower one twice as broad as the others and emarginate, the whole corolla bearded inside especially under the upper lobes. Stamens scarcely exerted from the tube, shorter than the lobes. Ovary oblong, glabrous, with 2 pairs of ovules to each cell. Fruit tapering into a beak exceeding the calyx.—F. v. M. Myop. Pl. t. 16, *Pholidia polyclada*, F. v. M. in Hook. Kew Journ. viii. 201, and in Trans. Phil. Soc. Vict. i. 47.

Hab.: Desert on the Suttor, *F. v. Mueller, Sutherland*; Cape River, *Bowman*; Curriwillinghi, *Dalton*; Bulloo River, *J. F. Bailey*. A common inland swamp plant.

The species is nearly allied to *E. bignoniæflora*, differing chiefly in the narrow leaves and tapering ovary and fruit.

9. **E. bignoniæflora** (Bignonia-flowered), *F. v. M. in Proc. R. Soc. Tasm.* iii. 294, and *Pl. Vict.* ii. t. 55; *Benth. Fl. Austr.* v. 25. "Quirramurrah," Bulloo River, *J. F. Bailey*. A strong-scented tall shrub or small tree, quite glabrous and often glutinous. Leaves lanceolate or linear-lanceolate, acuminate, entire, contracted into a short petiole, 2 to 6 in. long. Pedicels solitary,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, more or less flattened, often recurved, but not turned up again. Calyx segments imbricate at the base, ovate, obtuse or

rarely acute, thickened in the middle, 2 to 3 lines long. Corolla glabrous outside, about 1 in. long, scarcely contracted above the ovary, the tube gradually enlarged from the base, the lobes all broad and short, the 2 uppermost more united, the lowest twice as broad as the others and 2-lobed. Stamens shortly exerted from the tube but shorter than the corolla-lobes. Ovary 2-celled, with 2 pairs of ovules to each cell. Drupe ovate, acute,  $\frac{1}{2}$  in. long or more, succulent, the putamen hard and bony, more or less completely 4-celled.—F. v. M. Myop. Pl. t. 15; *Stenochilus bignoniaylorus*, Benth. in. Mitch. Trop. Austr. 386.

Hab.: Balonne River, *Mitchell*; Suttor River, *Bowman*, *Sutherland*; Rockhampton, *Herb. F. Mueller*; Georgina and other inland localities.

Wood of a yellowish-brown, close in grain, prettily marked and fragrant; useful for cabinet work.—*Bailey's Cat. Ql. Woods*, No. 297.

Supposed poisonous to stock.

10. **E. Freelingii** (after Captain Freeling), *F. v. M. in Proc. R. Soc. Tasm.* iii. 295; *Benth. Fl. Austr.* v. 25. An erect shrub, more or less hoary-tomentose and glutinous or the foliage at length glabrous. Leaves crowded, lanceolate, acute, entire, contracted into a rather long petiole,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long. Peduncles solitary, mostly 2 to 3 lines long. Calyx-segments much imbricate, ovate or lanceolate, rather acute or acuminate, not dilated upwards, the outermost usually much broader and larger than the inner ones. Corolla above 1 in. long, pubescent outside, the tube constricted above the ovary, then enlarged, the 4 upper lobes rather broad and acute, the 2 uppermost more united than the others, the middle lower lobe broader and obtuse. Stamens included. Ovary ovoid, with 2 or 3 pairs of ovules in each cell, suspended from short broad flat erect superposed funicles. Drupe conic-oval 4-celled.—F. v. M. Myop. Pl. t. 11.

Hab.: Towards Cooper's Creek.

11. **E. Goodwinii** (after — Goodwin), *F. v. M. Repp. Babb. Exped.* 17; *Benth. Fl. Austr.* v. 25. A shrub of several feet, more or less glandular and viscid and often hirsute with spreading hairs which are rarely wanting on the calyxes and pedicels. Leaves linear or linear-lanceolate, acutely acuminate, entire, scarcely contracted or even dilated at the base and sessile, the midrib often very prominent underneath, mostly 1 to nearly 2 in. long. Pedicels solitary,  $\frac{1}{2}$  to 1 in. long or even more. Calyx-segments much imbricate, lanceolate, very acute, 4 to 8 lines long, the outer one usually broader and the 2 innermost smaller than the others. Corolla more or less pubescent outside,  $\frac{3}{4}$  to above 1 in. long, the lobes broad, obtuse or shortly acute, the 2 uppermost more united, the middle lowest lobe scarcely broader than the others. Stamens included. Ovary shortly ovoid, very hairy, with 2 pairs of ovules in each cell. Fruit very obtuse or retuse, hairy, 4 to 5 lines long, very thick with a thick bony 4-celled putamen.—F. v. M. Myop. Pl. t. 2.

Hab.: Wilson's River and Bulloo, *J. C. Weale*; and towards Cooper's Creek.

12. **E. Willsii** (after W. J. Wills), *F. v. M. Fragm.* iii. 21, t. 20; *Benth. Fl. Austr.* v. 26. Branches and foliage more or less covered with a glandular rust-coloured pubescence and somewhat glutinous. Leaves obovate-oblong, obtuse or almost acute, entire or serrulate, contracted at the base but not petiolate, about 1 in. long. Pedicels solitary, hispid, short. Calyx-segments much imbricate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long and enlarging after flowering, the outermost almost ovate, the innermost narrow, all acute. Corolla glabrous, or slightly pubescent outside, blue, the lobes all broad obtuse, or very shortly acute, the middle lower one rather broader than the others. Stamens included. Ovary narrow, densely tomentose, with 2 pairs of ovules in each cell. Fruit conical, hairy, 4-celled.—F. v. M. Myop. Pl. t. 6.

Hab.: A variety with branches and leaves glabrous found by *Ch. Winnecke* near the Queensland border (*F. v. M.*)

13. **E. Brownii** (after the celebrated botanist, Dr. Robt. Brown), *F. v. M. in Proc. R. Soc. Tasm.* iii. 297, *Benth. Fl. Austr.* v. 27. A shrub attaining sometimes several feet, rarely quite glabrous, more frequently with the branches and young shoots and sometimes the adult foliage hoary or white with a close almost mealy tomentum. Leaves lanceolate or rarely elliptical oblong or cuneate, obtuse or acute, entire or very rarely marked with a few serratures, contracted into a petiole, very variable in size, most frequently  $\frac{3}{4}$  to 1 in. long, but in some specimens all under  $\frac{1}{2}$  in. and crowded. Pedicels solitary, usually shorter than the calyx. Flowers yellow, red, or with these colours variously mixed. Calyx-segments imbricate, broadly or narrowly lanceolate, acuminate or almost obtuse, varying from scarcely above 1 line to above 3 lines long, the outer ones usually larger than the inner. Corolla glabrous or slightly pubescent outside, usually about 1 in. but in some specimens only 8 or 9 lines long, the tube constricted above the ovary, then dilated and incurved, the 4 upper lobes short narrow and acute, with sometimes an accessory one between the 2 uppermost, the lowest lobe narrow, rolled back, separated to about the middle of the corolla. Stamens exerted, usually long. Ovary with 2 pairs of ovules to each cell. Fruit ovoid or almost globular, succulent, 4 to 5 lines diameter when perfect, the putamen hard, almost perfectly 4-celled with 1 seed in each cell.—*F. v. M. Myop.* p. Pl. t. 38; *Stenochilus glaber*, *R. Br. Prod.* 517; *A. DC. Prod.* xi. 714; *Endl. Iconogr.* t. 92; *Bot. Mag.* t. 1942; *Bot. Reg.* t. 572; *S. viscosus*, *Grah.* in *Edinb. Phil. Journ.* vi. 387 and in *Bot. Mag.* t. 2930; *A. DC. Prod.* xi. 715; *Eremophila Grahami*, *F. v. M. in Proc. R. Soc. Tasm.* iii. 297; *S. ochroleucus* *A. Cunn.* (*S. maculata* var. *A. DC.*), *A. DC. Prod.* xi. 715; *S. albicans* and *S. subcanescens* *Bartl.* in *Pl. Preiss.* i. 351; *A. DC. l. c.*; *Eremophila albicans*, *F. v. M. in Proc. R. Soc. Tasm.* iii. 297; *S. incanus*, *Lindl. Bot. Reg.* 1839, *Misc.* 70; *Eremophila incana*, *F. v. M. in Proc. R. Soc. Tasm.* iii. 297.

Hab.: Between Warrego and the Maranoa, *Barton*; and several other inland localities.

Poisonous to stock similar to the common "Native Fuchsia" (*E. maculata*, *F. v. M.*)

14. **E. Duttoni** (after F. S. Dutton), *F. v. M. Rep. Babb. Exped.* 16; *Benth. Fl. Austr.* v. 28. An erect glutinous shrub, glabrous or the young shoots slightly tomentose. Leaves narrow-lanceolate, entire, tapering into a long acute point, contracted at the base but scarcely petiolate, 1 to 2 in. long. Pedicels solitary,  $\frac{1}{2}$  in. long or more, very spreading and turned up towards the end. Flowers orange-red. Calyx-segments ovate, acute or acuminate, and 4 to 6 lines long at the time of flowering, afterwards often enlarged, broad, coloured, almost scarious and veined. Corolla usually glabrous outside, slightly bearded inside, 1 to  $1\frac{1}{4}$  in. long, the tube constricted above the ovary, then enlarged and slightly curved, the 4 upper lobes short and acute, the lowest oblong, obtuse, separate to about  $\frac{1}{3}$  of the corolla. Stamens exerted. Ovary glabrous or slightly glandular-pubescent, with a pair of ovules to each cell. Fruit succulent, shining, shorter than the enlarged calyx, the putamen hard and bony, usually 4-celled, with one seed in each cell. *F. v. M. Myop.* Pl. t. 36.

Hab.: Towards Cooper's Creek.

15 **E. maculata** (spotted), *F. v. M. in Proc. R. Soc. Tasm.* iii. 297; *Benth. Fl. Austr.* v. 29. Native Fuchsia. A tall shrub, with rigid divaricate branches, more or less hoary-tomentose or pubescent, the adult foliage usually glabrous. Leaves mostly lanceolate, varying however from elliptical-oblong to linear, acute or obtuse, entire, contracted into a petiole, rarely above 1 in. long, flat and green on both sides or hairy when young. Pedicels solitary, often above  $\frac{1}{2}$  in. long, very spreading or reflexed, but turned up again under the flowers. Calyx-segments much imbricate and ovate at the base, acuminate, 2 to 3 lines long or more. Corolla glabrous outside, red, more or less variegated with yellow or quite yellow, 1 in. long or more, the broad tube constricted above the ovary, the upper

part slightly incurved and not much dilated, the 4 upper lobes short and acute, the lowest one narrow, recurved, separated to below the middle of the corolla. Stamens usually but perhaps not always exserted. Ovary glabrous, with 2 or 3 pairs of ovules to each cell. Fruit ovoid-globular, shortly acuminate, above  $\frac{1}{2}$  in. diameter, very succulent, with a hard bony putamen, completely 2-celled and less perfectly 4-celled. Seeds small, without so much albumen as in some species—F. v. M. Myop. Pl. t. 35; *Stenochilus maculatus*, Ker. in Bot. Reg. t. 647; R. Br. App. Sturt, Exped. 22; *S. racemosus* Endl. Nov. Stirp. Dec. 50; A. DC. Prod xi. 715; *S. curvipes*, Benth. in Mitch. Trop. Austr. 221.

Hab.: Warrego river, *Mitchell*; Isaacs and Fitzroy rivers, *Bowman and others*; Curriewillinghie, *Dalton*; Darling Downs, *Lau*. Very common on inland Downs country.

Var. *flava*. Only differs from the common form in the flowers being all yellow. Rare in Queensland.

All forms of this species are alike poisonous to stock, and year after year a considerable number of deaths occur from this cause.

## ORDER XCV. VERBENACEÆ.

Flowers irregular or rarely regular. Calyx persistent, truncate toothed or lobed. Corolla with 4 or 5, rarely 6 to 8, lobes or rarely truncate, the lobes more or less 2-lipped or nearly or quite equal, imbricate in the bud, the upper lip or uppermost lobe or sometimes the lateral one outside. Stamens inserted in the tube of the corolla, usually 4 in pairs or nearly equal and alternating with its lower lobes, or when the corolla is regular 4 to 8 alternating with its lobes. Anthers 2-celled, the cells opening longitudinally and usually parallel. Ovary not lobed or only shortly 4-lobed, usually more or less perfectly divided into 2 or 4 cells or half-cells, with 1 ovule in each cell or half-cell, either anatropous and erect from the base, or more or less amphitropous and attached laterally or near the top so as to appear pendulous. Style terminal, simple, entire or more frequently with 2 short stigmatic lobes. Fruit dry or more or less drupaceous, the whole fruit or the endocarp separating into 2 or 4 nuts or pyrenes or quite dehiscent and 2 or 4-celled, and sometimes with an additional central cavity between the carpels having the appearance of a third or fifth empty cell. Seeds solitary in each cell half-cell or pyrene, erect, with or without albumen, the testa usually membranous. Embryo straight, with thick cotyledons and an inferior radicle.—Herbs shrubs trees or woody climbers. Leaves opposite whorled or rarely alternate, without stipules, entire toothed or divided. Inflorescence various.

A large Order, ranging over both the New and the Old World, most abundant within the tropics, but with several extratropical species, both in the northern and southern hemispheres.

TRIBE I **Chloanthææ**.—Ovary 2-celled, cells 2 rarely 1 ovulate, ovules laterally attached. Seeds, where known, albuminous. Shrubs or rarely herbs, usually very cottony or woolly, rarely nearly glabrous, glutinous or resinous.

\* Corolla-lobes 4 to 8, subequal. Stamens same number.

Flowers 5-merous in dense woolly spikes. Style minutely 2-lobed. . . . 1. NEWCASTLIA.

Flowers 5-merous, corymbose or in head-like clusters. Style deeply 2-lobed . . . . . 2. DICRASTYLES.

\*\* Corolla 2-lipped, or unequally 5-lobed. Stamens 4, anthers pointless.

Calyx-lobes narrow, herbaceous. Corolla-tube elongate. Anthers without appendages. Leaves decurrent, bullate-rugose. Flowers axillary . . . . . 3. CHLOANTHES.

Calyx-lobes narrow or increasing to ovate or oblong. Corolla-tube broad; anther cells often with basal appendages. Leaves not decurrent. Flowers axillary, solitary or cymose or spicate, often leafy . . . . . 4. PITYRODIA.

\*\*\* Corolla 5, rarely 4-lobed. Stamens 4, anthers apiculate at base. Flowers axillary.

- Calyx small, open, 5-fid. Corolla small. Fruit drupaceous, soon dry.  
 Leaves small and distant. Flowers solitary in the axils . . . . . 5. SPARTOTHAMNUS.  
 Calyx 5-fid. Corolla small. Ovary 2-celled, 1 ovule in each cell.  
 Drupe almost dry, enclosed in the calyx. Herbs with hard thin  
 branches. Leaves small. Flowers 1 to 5, shortly pedicellate in the  
 axils . . . . . 6. NESOGENES.

TRIBE II. **Verbeneæ**.—Ovules ascending from the base of the cells. Flowers in racemes or spikes, sometimes contracted into heads, solitary within each bract, without bracteoles.

- Ovary 2-celled, with 1 ovule in each cell. Spikes dense, usually contracted into heads. Fruit a drupe . . . . . 7. \*LANTANA.  
 Fruit dry, separating into small nuts . . . . . 8. LIPPIA.  
 Calyx narrowly cylindrical, 5-ribbed. Stamens 4 . . . . . 9. \*STACHYTARPHETA  
 Ovary 4-celled, with 1 ovule in each cell. Spikes elongated . . . . . 10. VERBENA.

TRIBE III. **Viticeæ**.—Inflorescence cymose, centrifugal; cymes paniculate. Drupe 4-celled. Trees or shrubs.

\* Corolla regular. Stamens isomerous, equal. Leaves entire.

- Flowers 4-merous. Drupe with 4 pyrenes . . . . . 11. CALLICARPA.

\*\* Corolla 2-lipped, stamens didynamous.

\* Drupe 1 pyrene, 4-celled.

- Leaves entire or toothed. Flowers small . . . . . 12. PREMNA.  
 Leaves entire or toothed. Corolla large . . . . . 13. GMELINIA.  
 Leaves digitate or 1-foliolate . . . . . 14. VITEX.

\*\* Drupe 4-partite or by abortion reduced to 1 segment. Leaves simple.

- Stamens 4 didynamous, long, exserted. Flowers large . . . . . 15. FARADAYA.  
 Stamens long, fruiting calyx enlarged . . . . . 16. CLEROBENDRON.

TRIBE IV. **Avicennieæ**.—Fruit a 2-valved capsule. Seed solitary, without integuments; embryo with large folded cotyledons.

- Single genus . . . . . 17. AVICENNIA.

## 1. NEWCASTLIA, F. v. M.

(After Duke of Newcastle.)

Calyx campanulate, 5-lobed, valvate in the bud. Corolla-tube campanulate, the limb of 5 nearly equal lobes. Stamens 5; anthers without appendages. Ovary small, completely 2-celled with 2 ovules in each cell laterally attached above the middle. Style slender, entire, or minutely 2-lobed. Fruit not exceeding the calyx, not succulent, apparently separating into 4 nuts.—Densely woolly or cottony shrubs. Leaves opposite, undivided. Flowers opposite and sessile, in dense terminal woolly spikes. Bracts and bracteoles small and deciduous.

The genus is endemic in Australia, and closely allied to *Physopsis* and *Mallophora*, differing from them chiefly in the 5-merous flowers.

- Flowers in rather long spikes. Corolla-lobes short. Stamens shorter than the corolla . . . . . 1. *N. cladotricha*.  
 Flowers in heads . . . . . 2. *N. cephalantha*.

1. **N. cladotricha** (branched-hairs), *F. v. M. in Hook. Kew Journ.* ix. 22, *Fragm.* i. 184, t. i. and iii. 21; *Benth. Fl. Austr.* v. 40. An erect shrub, attaining 2 to 3 ft., densely clothed with white or rust-coloured woolly branching hairs, and strongly scented. Leaves sessile, narrow-oblong to ovate-lanceolate, obtuse, rounded at the base, the margins slightly recurved,  $\frac{3}{4}$  to above 1 in. long, thick, very rugose, reticulate underneath, loosely hirsute or tomentose on both sides with branched hairs. Flowering spikes at first short and dense but lengthening sometimes to 2 in. and interrupted. Bracts ovate or ovate-lanceolate, imbricate in the very young spike, but falling off early. Calyx about  $1\frac{1}{2}$  line long, very woolly, the lobes rather shorter than the tube. Corolla glabrous outside, the tube broad, about as long as the calyx, lobes short and spreading. Stamens

about as long as the tube, inserted above a woolly ring near the base. Ovary glabrous. Ovules attached near the top, but the seed enlarges upwards so as to be attached near the base. The fruit not seen however quite ripe.

Hab.: St. George, *J. Wedd.*

2. ***N. cephalantha*** (flowers in heads), *F. v. M. Fragm.* ix. 4. Leaves small, oblong-ovate with recurved margins,  $\frac{1}{2}$  to 1 in. long, somewhat thick, sessile. Flowers in sessile heads. Bracts small. Calyx tomentose-villous, teeth shorter than the tube. Corolla about 2 lines long. Style capillary, glabrous, scarcely 2 lines long. Stigma punctiform. Drupe globular,  $1\frac{1}{2}$  line long, 4-celled.

Hab.: Lake Nash, *Michael Costello.*

## 2. DICRASTYLES, Drumm.

(Alluding to the 2-branches of style).

Calyx more or less deeply divided into 5 lobes. Corolla-tube short, the limb of 5 nearly equal short lobes. Stamens 5, exerted; anthers without appendages. Ovary 2-celled, with 2 ovules in each cell, laterally attached at or above the middle. Style deeply divided into 2 slender branches or lobes. Fruit small, dry, 4-celled, with 1 seed in each cell.—Cottony or woolly undershrubs or small shrubs. Leaves opposite or scattered, undivided. Flowers small, in cymes collected into corymbose panicles, more rarely contracted into dense solitary or corymbose heads. Bracts and bracteoles very deciduous.

The genus is limited to Australia.

Leaves linear, 6 to 9 lines long. Flowers in elongated spike-like panicles

3 to 4 in. long . . . . .

1. *D. Costelloi.*

Leaves linear, about 6 lines long. Flowers in compact head-like cymes . . .

2. *D. Weddii.*

Leaves lin. or more long, 3 to 6 lines broad. Flowers few or many in each

cluster . . . . .

3. *D. Doranii.*

Leaves 4 to 8 lines long,  $\frac{1}{2}$  to  $1\frac{1}{2}$  line broad. Flowers few in each cluster . .

4. *D. Lewellini.*

1. ***D. Costelloi*** (after Michl. Costello), *Bail. Bot. Bull.* iv. An erect undershrub attaining about 18 in. in height, slightly branched. Branches and stems terete, hoary-white with a close tomentum. Leaves scattered, often close, and appearing opposite or in whorls of 3, linear, obtuse, with revolute margins, from  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long and 1 line broad, tomentose when young, the older ones rugose. Flowers in small clusters in an elongated terminal spike-like panicle 3 or 4 in. long, only branched at the base; each branch short, and bearing a sessile cluster or head of densely white tomentose flowers. Bracts and bracteoles lanceolate, minute, glabrous inside, the outside densely clothed with branched hairs like the rest of the plant. Flowers nearly globose, scarcely 2 lines in diameter, on very short pedicels. Calyx divided to near the base, densely covered with branched hairs outside, inside glabrous. Corolla-lobes twice as long as the calyx-lobes, the outside at the base tomentose, the tips glabrous and membranous, the inside glabrous except for a rather large patch of long simple hairs at the base of the lobes. Stamens opposite to and about half the length of the calyx-lobes; filaments glabrous; anthers glabrous, large and deeply lobed. Ovary and entire part of the style densely covered with white, flat, scale-like hairs like those on the other parts of the plant. Style-branches rather long and slender.

Hab.: Near Lake Nash, on the boundary line between Queensland and the Northern Territory of South Australia, *M. Costello.*

In many respects this new species approaches *D. Beveridgei*, *F. v. M. Fragm.* viii. 50; but no description is there given of the stamens, so one may suppose them to be exerted as in all previously described species. Thus I rely principally upon the difference in indumentum of flowers and length of stamens for distinguishing *D. Costelloi* from others of the genus.

2. **D. Weddii** (after Jos. Wedd), *Bail. Bot. Bull.* x. A small erect shrub, clothed with a close white tomentum of branched hairs. Leaves opposite or scattered, linear, obtuse, about  $\frac{1}{2}$  in. long, with closely revolute margins. Flowers in compact head-like cymes. Bracts about as long as the calyx, ovate. Calyx nearly 2 lines long, divided to near the base into lanceolate lobes, glabrous on the inside and nearly equal. Corolla longer than the calyx, outside covered by branched hairs, the tube slender in the middle, swelled around the ovary, the upper with 5 blunt lobes, one much longer than the rest, broad and open, woolly in the throat. Stamens, only 2 in all the flowers examined bearing anthers, the others being apparently abortive; filaments longer than the corolla-tube, and hairy. Anthers large with divaricate lobes. Style with 2 long glabrous slender branches, entire portion with long branched hairs like the stamens. Fruit globose, 4-celled, with 1 seed in each cell.

Hab.: St. George, Jos. Wedd.

3. **D. Doranii** (after P. Doran), *F. v. M. Fragm.* viii. 230. Plant covered with a thin grey tomentum; branches nearly terete. Leaves sessile or very shortly petiolate, lin. or more long, 3 to 6 lines broad, ovate or oblong-lanceolate margin recurved, veins reticulate. Flower-heads in panicle of few or many flowers. Calyx-teeth deltoid scarcely as long as the tube, white tomentose. Corolla glabrous outside, densely bearded at the throat. Stamens not exerted. Style  $1\frac{1}{2}$  line long tomentose at the base. Fruit globose.

Hab.: On the Queensland border, Central Australia. C. Winnecke, (*F. v. M.*)

Var. *eriantha*, *F. v. M. Rep. on pl. coll. by Mr. Ch. Winnecke, in Cen. Aust.* 1883. Leaves narrower, conspicuously tomentose. Flower clusters 2 or more superposed along the rhachis. Calyxes involved in a dense wool. Corolla almost bell-shaped, the tube short and turgid, lobes obtuse.

4. **D. Lewellini** (after Dr. H. Lewellin), *F. v. M. Fragm.* xi. 86, and *Rep. on Winnecke's coll.* 1883. Plant erect, grey-tomentose. Leaves crowded, broad-linear 4 to 8 lines long, margins revolute. Flowers in interrupted terminal spikes. Bracts ovate or rhomboid-lanceolate. Calyx hoary-tomentose, lobes acuminate scarcely 3 lines long. Corolla bluish, tube cylindric somewhat broad, silky hairy inside, lobes acute. Stamens exerted, the fifth one often wanting, but sometimes developed and quite perfect. Ovary white-tomentose.

Hab.: On Queensland border, Central Australia, C. Winnecke (*F. v. M.*)

### 3. CHLOANTHES, R. Br.

(Flowers greenish-yellow.)

Calyx more or less deeply divided into 5 narrow herbaceous lobes. Corolla-tube elongated, usually incurved and dilated upwards; limb 2-lipped, the upper lip erect at the base with 2 spreading lobes, the lower lip 3-lobed, spreading. Stamens 4, somewhat didynamous, inserted below the middle of the tube above a ring of cottony hairs, shorter than the upper lip; anthers without any or with very obscure appendages. Ovary imperfectly or almost perfectly 2-celled with 2 ovules in each cell laterally attached. Style very shortly 2 lobed. Fruit a dry 4-celled drupe, the endocarp separating into 2 hard 2-celled nuts, leaving between them a central cavity reaching halfway up. Seeds solitary in each cell, ascending, with a thin testa and copious albumen.—Perennials undershrubs or shrubs, more or less cottony woolly or glandular-hirsute. Leaves opposite or in whorls of three, narrow, bullate-rugose and decurrent along the stem. Flowers axillary, solitary, shortly pedicellate, with a pair of bracteoles below the calyx, the upper flowers sometimes forming a leafy spike.

The genus is limited to Australia. The transformation of the imperfectly 2-celled ovary into a completely 4-celled fruit in this and the following genus is affected by the growth of the endocarp round the seeds, filling up the cavity in the upper part, but usually leaving in the lower part a vacuity or so-called fifth empty cell.—*Benth.*

Flowers mostly axillary and distant.

Leaves narrow with very recurved margins, white underneath.

Corolla tube narrow (variable in size), glabrous inside except the ring of hairs near the base . . . . . 1. *C. stœchadis*.

Corolla-tube short and broad, hairy inside under the upper lip . . . . . 2. *C. parviflora*.

1. ***C. stœchadis*** (*Stœchas*-like) *R. Br. Prod.* 514; *Benth. Fl. Austr.* v. 45. A perennial or undershrub, with erect simple or branched stems of 1 to 2 ft. Leaves opposite, linear or linear-lanceolate, but often almost terete owing to the revolute margins, obtuse, rarely above 1 in. long, exceedingly bullate-rugose and scabrous-muricate on the upper or outer surface, which is decurrent along the stem to the next pair of leaves, the under-surface woolly-white but often quite concealed by the revolute margins. Flowers yellowish, on very short axillary pedicels, with a pair of linear-bracteoles rugose like the leaves but shorter than the calyx, inserted about the middle of the pedicel. Calyx 4 to 5 lines long, more or less clothed with woolly hairs inside and out, divided to the middle or lower down into 5 lanceolate or linear herbaceous lobes, bullate like the leaves. Corolla in the typical form above 1 in. long, pubescent outside, the tube gradually dilated upwards and slightly curved, glabrous inside except a ring of woolly hairs above the ovary, the upper lip erect, somewhat concave, with two short spreading lobes, the lower lip divided into 3 acute very spreading lobes, the middle one rather longer and more reflexed than the others. Ovary densely villous. Fruit separating into 2 hemispherical, reticulate hairy cocci, the exocarp membranous, the endocarp and the placenta forming in each a bony 2-celled nut with 1 seed in each nut.—*Schau. in DC. Prod.* xi. 532; *C. larandulifolia*, *Seib. in Spreng. Syst.* ii. 756.

Hab.: Among the Cooper's Plains specimens of *C. parviflora* were some which probably belonged to this species.

Var. *parviflora*. Flowers smaller, but shaped like those of *C. stœchadis*, the corolla about  $\frac{3}{4}$  in. long.

2. ***C. parviflora*** (flowers small), *Walp. Rep.* iv. 58; *Benth. Fl. Austr.* iv. 46. An erect perennial or undershrub, with the habit and foliage of *C. stœchadis*, but the calyx is more deeply divided, and the corolla not above  $\frac{3}{4}$  in. long, has the throat or upper portion of the tube broader and very hairy inside below the upper lip with long whitish hairs, the lobes are also much shorter and all obtuse. Stamens usually shorter than in *C. stœchadis*, but variable. Fruit as in *C. stœchadis*. The colour of the flower is uncertain, being variously described as purple, light blue, yellow, or yellowish.—*Schau. in DC. Prod.* xi. 532.

Hab.: Rockingham Bay, *Dallachy*; Sandy Cape, *The Hon. Miss Lovell*, also at Helidon and Cooper's Plains.

#### 4. **PITYRODIA.** *R. Br.*

(Alluding to the scurfy surface of the plants.)

(*Quoça*, *Gaudich*, *Dasymalla*, *Endl.*)

Calyx more or less deeply five-lobed. Corolla-tube broad, usually short, more rarely elongated; limb of 5 spreading lobes more or less distinctly 2-lipped, or oblique with the lowest lobe much larger than the others. Stamens 4, usually didynamous; included or shortly exserted; anther-cells all, or one of each anther, or those of one pair of anthers, tipped at the lower end by a small or very prominent appendage rarely entirely deficient. Ovary imperfectly or almost perfectly 2-celled, with 2 ovules in each cell laterally attached to a short or very long funicle. Style very shortly 2-lobed, and often dilated at the base of the lobes. Fruit a dry drupe, the endocarp separating into two 2-celled nuts with one seed in each cell, or reduced by abortion to one or two single-seeded nuts. Seeds ascending, with a thin testa and copious albumen.—Shrubs or undershrubs,



more or less clothed with cottony wool. Leaves scattered or irregularly opposite, not decurrent. Flowers solitary, or in cymes or clusters, axillary or collected in terminal cymes or leafy spikes.

The genus is limited to Australia.

1. **P. salvifolia** (Salvia-leaved), *R. Br. Prod.* 513; *Benth. Fl. Austr.* v. 48. A shrub of spreading growth, attaining 6 to 8 ft., with a strong sage-like scent, the branches densely clothed with a woolly tomentum usually rust-coloured, but sometimes whitish. Leaves opposite, shortly petiolate, lanceolate or almost linear, obtuse or rather acute, 2 or 3 or even 4 in. long, very rugose, pubescent above, cottony and rusty or whitish underneath. Flowers nearly sessile, in axillary clusters of 2, 3, or rarely more. Bracts very narrow, the outer ones shorter than the calyx, the inner ones much smaller. Calyx turbinate-campanulate, nearly 3 lines long, prominently ribbed, tomentose, divided to rather below the middle into lanceolate acuminate lobes. Corolla white, scarcely exceeding the calyx, the tube broadly campanulate, with a dense ring of hairs inside below the stamens; lobes shorter than the tube, the 2 upper ones rather more united, the middle lower one rather broader than the others. Filaments very short; anthers almost exserted, the two lower ones with prominent appendages, the two upper ones with shorter ones, and sometimes with a fifth rudimentary stamen. Ovary glabrous; ovules attached close to the top with a short funicle. Fruit almost completely 4-celled.—*Schau. in DC. Prod.* xi. 628; *Premna salvifolia*, *Spreng. Syst.* ii. 755.

Hab.: Northumberland islands, *R. Brown*; barren rocky hills, Cleveland Bay, *A. Cunningham*; near Rockhampton, *O'Shanesy*; near Mount Hedlow, *Dallachy*; Mount Perry, *Jas. Keys*.

##### 5. SPARTOTHAMNUS, A. Cunn.

(From the branches being used for cordage).

Calyx very open, 5-lobed. Corolla-tube short and broad; limb spreading, 5-lobed, the middle lower lobe rather larger than the others. Stamens 4, exserted; anther-cells with minute tips at the lower end. Style filiform, with 2 rather long branches. Ovary imperfectly 2-celled, with 2 ovules in each cell laterally attached at or above the middle. Fruit a small globular succulent drupe, the endocarp separating into 4 1-seeded pyrenes, usually separated at the base by a central cavity. Seeds albuminous.—Shrub or undershrub, with few small distant leaves, all opposite and not decurrent. Flowers very small, solitary in the axils, with small bracteoles.

The genus is limited to a single species, endemic in Australia, very nearly allied to *Pityrodia*, but with a different habit.

1. **S. junceus** (Rush-like), *A. Cunn. in Loud. Hort. Brit.* 600, and in *Walp., Rep.* vi. 694; *Benth. Fl. Austr.* v. 55. An undershrub or shrub of several ft., glabrous or pubescent with branching hairs, the branches divaricate, rigid, acutely 4-angled, broomlike and appearing almost leafless, the smaller branchlets often 2 or 3 together at the nodes. Leaves small and distant, often reduced to small scales, all opposite, when more developed especially on young shoots  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, lanceolate or ovate-lanceolate, entire or with a few coarse teeth, the margins recurved. Flowers very small, on short pedicels with 2 small bracteoles about the middle. Calyx about 1 line long. Corolla shortly exceeding the calyx, the tube broad, with a ring of short hairs inside near the top, the lobes rather longer than the tube. Ovary glabrous. Fruit quite smooth, orange-red. 1 to 2 lines diameter.—*A. DC. Prod.* xi. 705.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*; Suttor Range and Burnet River, *F. v. Mueller*; Wide Bay, *Leichhardt*; Cape and Isaacs Rivers, *Bowman*; sandstone ridges of the interior, *Mitchell*; Armadilla, *W. Barton*.

This plant had been placed in Myoporinæ and retained there by A. De Candolle (who had no specimens in an examinable state) owing to Walpers having erroneously described the radicle as superior. F. v. Mueller, in referring it correctly to Verbenaceæ (Fragm. vi. 153) adduces *Teucrium*. Hook. f. from New Zealand, as a second species, which, however, can scarcely be admitted—the anthers and lobed ovary and fruit of the latter plant showing a nearer relation to *Oreia* and a few other genera which connect Verbenaceæ with the tribe Ajugoideæ of Labiate. The albuminous seeds branching hairs and other characters of *Spartothamnus* are quite those of *Chloantheæ*.

Var. *puberulus*. Separated from *S. juncea* by Baron Mueller on account of its stellate down, larger leaves, shorter pedicels to the flowers, less pointed segments of calyx, and the stellate hairs on the outside of the corolla.—*S. puberulus*, F. v. M. in Wing's Sou. Sci. Rec., Mar. 1882.

Hab.: Maranoa and Warrego.

## 6. NESOGENES, A. DC.

(The plants occurring upon islands).

Calyx-tube oblong; teeth 5, large, rather unequal. Corolla-tube funnel-shaped; lobes 5, round, nearly equal. Stamens 4, obscurely didynamous, shorter than the corolla; filaments short. Ovary obovoid, 2-celled; ovules solitary in the cells; style simple; stigma capitate. Fruit a small dry drupe, enclosed in the persistent calyx-tube.—Herbs or shrubs, with small opposite leaves and flowers solitary or fascicled in their axils.

1. **N. euphrasioides** (Euphrasia-like), A. DC., Prod. xi. 703. Branches opposite pubescent. Leaves opposite, scarcely  $\frac{1}{2}$  in. long, ovate, somewhat acute, entire or crenate-dentate, pubescent and shortly attenuate to the petiole. Pedicels short. Calyx pubescent, tube 5-ribbed. Ovary ovoid attenuated into the filiform style. Drupe mucronate by the remains of the style, girt by the persistent calyx, 2-celled, cells 1-seeded.—*Myoporum* (?) *euphrasioides*, Hook. and Arn. Bot. Beech. Voy. 67.

Hab.: Whitsunday Island.

## 7. \*LANTANA, Linn.

(From *lento*, to bend; one of the ancient names of the Viburnum).

Calyx small and thin, truncate or sinuately toothed. Corolla-tube slender; the limb spreading, 4- or 5-lobed, nearly regular or slightly 2-lipped. Stamens 4, included in the tube. Ovary 2-celled, with one ovule in each cell erect from the base. Fruit a more or less succulent drupe, the putamen 2-celled or dividing into two 1-celled pyrenes.—Shrubs or rarely herbs. Leaves opposite. Flowers in pedunculate axillary heads, rarely lengthening into spikes, each one sessile or nearly so within a small bract without bracteoles.

A considerable genus, chiefly from tropical or subtropical America. The ovary in this and the following genus, as shown by Bocquillon, although containing only 2 cells corresponding to the half-cells of other genera, is yet bicarpellary, one half only of each carpel being developed.—*Benth.*

Shrubs with prickly stems.

Flowers yellow, or orange turning red . . . . . 1. *L. Camara*.

Flowers bright-red, yellow in the centre . . . . . 2. *L. crocea*.

Stems procumbent

Flowers purplish red . . . . . 3. *L. Sellowiana*.

1. **L. Camara** (old generic name). Linn.; *Schau. in DC. Prod.* xi. 598; *Benth. Fl. Austr.* v. 34. A tall shrub with long weak branches, often armed with short recurved prickles, and more or less hairy. Leaves petiolate, ovate or slightly cordate, crenate, 2 to 3 in. long, wrinkled and very rough with short stiff hairs. Flowers yellow or orange, turning to a deep red; the heads not lengthening into spikes. Bracts linear-lanceolate, shorter than the corolla. Corolla-tube 3 to 4 lines long, lobes of the limb short and broad.

Hab.: A common species in tropical America. Naturalised and become a great pest.

2. **L. crocea** (copper-coloured). This species closely resembles *L. Camara*, but is much shorter and more compact, the heads of flowers are also the same size and form, but the colours are apt to sport, some plants producing white, others blue, the normal colour being bright red orange and yellow towards the centre of the head.

Hab.: South America. Naturalised but not become troublesome.

3. **L. Sellowiana** (after Mr. Sellow), *Link and Otto. Ic. Pl. Sel. Berol.* 107, t. 50. Stems procumbent. Leaves crenate-serrate, ovate. Peduncles 2 or more inches long. Flower-head flattish. Bracts ovate, imbricate, pubescent. Calyx minute, 4-toothed, hairy. Corolla bright purplish-red, the outside pale, tube dilated about the middle, yellowish at the base, lobes blunt or emarginate. Stamens attached near the middle of corolla-tube.—*Bot. Mag.* 2981.

Hab.: South America. Naturalised about Brisbane.

### 8. LIPPIA, Linn.

(after Augustus Lippi.)

(Zapania, Scop.)

Calyx membranous, either flattened with 2 keels or wings and 2-lobed, each lobe either entire or 2-toothed, or the whole calyx more equally tubular or globular and 2- or 4-toothed. Corolla-tube cylindrical or dilated upwards, the limb more or less distinctly 2-lipped, the upper lip entire or 2-lobed, the lower 3-lobed, all the lobes flat and spreading. Stamens 4, included in the tube or scarcely protruding. Ovary 2-celled, with 1 ovule in each cell erect from the base. Fruit not succulent, separating more or less readily into two indehiscent nuts.—Herbs or shrubs often glandular and aromatic or strong-scented. Leaves opposite or whorled, undivided. Flowers small, in simple spikes or heads, each one sessile in the axil of a single bract, without bracteoles, the bracts often closely imbricate.

A considerable American genus, a few species of which, including the two Australian ones, are also more or less widely spread over the warmer regions of the Old World. Bocquillon's character of the genus (*Revue*, p. 147), taken probably from the examination of a single species, will not apply to a large portion of the genus, including the commonest species of all, *L. nodiflora*.—*Benth.*

Prostrate or creeping perennial. Leaves obovate or cuneate. Peduncles in one axil of each pair. Calyx flat . . . . . 1. *L. nodiflora*.  
Shrub with straggling branches. Leaves ovate. Peduncles opposite. Calyx globular . . . . . 2. *L. geminata*.

1. **L. nodiflora** (knot-flowered), *Rich.*; *Schau. in DC. Prod.* xi. 585; *Benth. Fl. Austr.* v. 35. A prostrate or creeping perennial, with shortly ascending flowering branches, hoary with closely appressed hairs or nearly glabrous. Leaves from obovate to linear-cuneate, coarsely toothed at the apex,  $\frac{1}{2}$  to 1 in. long, narrowed into a petiole. Peduncles axillary but only one to each pair of leaves and much longer than them, each one bearing a spike at first short and ovoid, and sometimes very small, at length cylindrical, and when luxuriant attaining  $\frac{1}{2}$  to  $\frac{3}{4}$  in. or even more. Bracts closely imbricate, broadly spatulate, more or less fringed or toothed at the end, nearly  $1\frac{1}{2}$  line long. Calyx shorter than the bract, membranous, flat, divided in front nearly to the base, at the back to about the middle, into two keeled lobes, entire or 2-toothed at the apex. Corolla-tube scarcely exceeding the calyx, the lower lip twice as long as the upper one and about half as long as the tube. Fruit not one line long, readily separating into two nuts, with one half of the calyx adhering to each.—*Zapania nodiflora*, Lam.; *R. Br. Prod.* 514.

Hab.: Shoalwater Bay and Broadsound, *R. Brown*; Port Denison, *Fitzalan*; Fitzroy River, *Thozet*; Bowen River, *Bowman*; Moreton Island, *M'Gillivray*.

The species is very common in waste lands on banks and in sandy places, &c., all over the warmer parts of the world. It is very variable in the breadth of the leaves, the size of the spikes and flowers, the points and teeth of the bracts, etc.—*Benth.*

2. **L. geminata** (flower-heads in pairs), *Kunth*; *Schau. in DC. Prod.* xi. 582; *Benth. Fl. Austr.* v. 35. A strongly scented shrub, with long straggling branches, more or less hirsute, the young shoots often hoary. Leaves opposite or rarely in whorls of three, from broadly ovate to ovate-oblong, obtuse, crenate, very rugose,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long when broad, longer when narrow. Peduncles much shorter than the leaves, and mostly in both axils, each one bearing a small head of pink flowers becoming ovoid as the flowering advances. Bracts very broad, herbaceous, hispid, 1 to  $1\frac{1}{2}$  line long. Calyx shorter than the bract, membranous, nearly globular, neither flattened nor ribbed, 2-lobed, the lobes broad and obscurely 2-toothed. Corolla-tube  $1\frac{1}{2}$  line long, dilated upwards, the lobes short broad and nearly equal. Fruit separating into nuts.

Hab.: About Rockhampton, *Dallachy* and others. Probably introduced from South America, where it is often common, ranging from Buenos Ayres to Mexico.—*Benth.*

### 9. \*STACHYTARPHETA, *Vahl.*

(From *stachys*, a spike, and *tarphys*, thick, the inflorescence.)

Calyx tubular, persistent, compressed, oblique at the apex and minutely 4-toothed. Corolla with a long straight or curved cylindrical tube and 5 rounded spreading subequal divisions. Stamens 4, didynamous, included, the upper two without anthers. Ovary 2-celled; cells 1-ovulate; stigma capitate. Fruit included in the persistent calyx-tube, splitting up into 2 pyrenes.—Herbs, with simple opposite leaves, the flowers in very long spikes inserted in the hollow of a thickened cylindrical rhachis.

Nearly all the species belong to tropical America.

Plant about 2ft. high, leaves dark-green. Flowers deep-blue . . . . . 1. *S. dichotoma*.  
Plant 4 to 5ft. high, leaves pilose. Flowers rosy-red . . . . . 2. *S. mutabilis*.

1. **S. dichotoma** (branches forked), *Vahl., Enum.* i. 207. A dichotomously-branched soft-wooded small shrub about 2ft. high; branches 4-angular. Leaves 2 to 4in. long, ovate to ovate-oblong, base cuneate decurrent, apex acute, margins deeply erenate-serrate. Spikes slender, 6 to 18in. long; bracts narrow. Flowers deep blue.—*S. urticifolia*, *Sims. Bot. Mag.* 1848.

Hab.: Tropical America, now naturalized near townships.

2. **S. mutabilis** (flowers changing colours), *Vahl. Schauer in DC. Prod.* xi. 565. A strong robust plant often 4 to 5ft. high. Leaves large ovate-cordate pilose, margins crenate. Spikes very long and stout; bracts lanceolate, spreading, with a long awn. Flowers large rosy-red.

Hab.: Tropical America. Naturalized about Cooktown.

### 10. VERBENA. *Linn.*

(The old latin name used by Virgil and Pliny.)

Calyx 5-toothed. Corolla with a distinct tube, the limb spreading, rather unequally 5-lobed. Stamens 4 or rarely 2, included in the tube. Ovary 4-celled with one ovule in each cell erect from the base. Fruit not succulent, enclosed in the calyx, separating more or less readily into 4 1-seeded nuts.—Herbs or rarely shrubs. Leaves opposite, entire or divided. Flowers small, alternate, in simple or branched spikes, each one in the axil of a small bract without bracteoles.

The genus comprises a large number of American species, with only two natives of the warmer regions of the Old World, including the Australian one; the other species here enumerated have been introduced from America.

Leaves mostly deeply lobed or divided. Spikes long and slender, with distant flowers

Leaves narrow, toothed. Spikes rather close, in a terminal cluster or panicle

Leaves harsh, oblong-lanceolate, with very prominent veins and sharply toothed

1. *V. officinalis*.

2. *V. bonariensis*.

3. *V. venosa*.

1. ***V. officinalis*** (officinal), *Linn.*; *Schau. in DC. Prod.* xi. 547; *Benth. Fl. Austr.* v. 36. An erect perennial 1 to 3ft. high, with long spreading wiry branches, sometimes nearly glabrous, usually with closely appressed hairs, sometimes more coarsely hirsute, or the inflorescence rough with glandular hairs. Lower leaves petiolate, obovate or oblong, coarsely toothed or cut; upper ones either deeply pinnatifid and lobed or toothed, or the uppermost small and lanceolate. Flowers usually very small, in slender spikes lengthening often to 8 or 10in., the lower ones becoming distant as the spike lengthens, the whole corolla sometimes not 2 lines long, but in the larger-flowered forms the tube about 1½ line, and the lower lip about as long.—*R. Br. Prod.* 514.

Hab.: Broadsound and Shoalwater Bay, *R. Brown*; Rockingham Bay, *Dallachy*; Suttor River, *Bowman*; Armadilla, *W. Barton*. This is a common weed throughout the colony.

The species is common in a great part of Europe and temperate Asia, in waste places on roadsides, &c.; more rare and perhaps introduced into North America, South Africa, and within the tropics.

Var. *macrostachya*, Flowers rather larger, and the spikes very glandular, hirsute,—*V. macrostachya*, *F. v. M. Fragm.* i. 60.—Peak Downs, *F. v. Mueller*; Rockhampton, *Bowman*.

\*2 ***V. bonariensis*** (of Buenos Ayres) *Linn.*; *Schau. in DC. Prod.* xi. 541; *Benth. Fl. Austr.* v. 36. An erect coarse rigid herb of 2 to 5ft., the stems scarcely branched, acutely 4-angled and roughly hispid especially on the angles. Leaves sessile, lanceolate or the lower ones ovate-lanceolate, 1½ to nearly 3in. long, coarsely toothed, hirsute, the upper ones distant small and narrow. Flowers in rather close spikes often 3in. long, which are usually clustered at the end of the branches of a rigid corymbose trichotomous panicle, and generally assume a blueish purple hue. Bracts acute, ciliate, hirsute, 1 to 1½ line long. Calyx shorter than the bract. Corolla-tube shortly exceeding the calyx, the lobes broad and spreading.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*. A pest on scrub land.

\*3. ***V. venosa*** (nerved), *Gill. and Hook. Bot. Misc.* i. Stems erect, usually 1 to 2ft. high, arising from creeping stems beneath the surface of the ground. Leaves rough, oblong-lanceolate, strongly-veined and sharply-toothed, sessile. Spikes oblong, forming a terminal panicle. Calyx and bracts hairy, more or less stained with purple. Corolla curved, rich purple, the tube hairy. Ovary glabrous.—*Bot. Mag. t.* 3127.

Hab.: Buenos Ayres. Naturalised in several southern parts.

## 11. CALLICARPA, Linn.

(Referring to the beauty of the fruit).

Calyx truncate or 4-rarely 5-toothed. Corolla with a short tube, the limb spreading, of 4, rarely 5, lobes, nearly equal. Stamens 4, rarely 5, shortly exerted. Ovary 4-celled, with 1 ovule in each cell laterally attached at or above the middle; style filiform, dilated and truncate or very shortly 2-lobed. Fruit a small succulent drupe, the endocarp of 4 distinct 1-seeded nuts or pyrenes. Seed without albumen.—Shrubs, rarely undershrubs, more or less cottony or woolly with stellate hairs or rarely glabrous, and often with numerous resinuous glandular dots especially on the under side of the leaves. Leaves opposite, undivided. Flowers small, in axillary cymes, with very small bracts.

A considerable tropical and subtropical genus, chiefly Asiatic, with a few African and American species. The genus is most readily distinguished from *Premna* by the inflorescence, and by the flowers more regular with isomerous stamens. The differences in the fruit may not be constant.—*Benth.*

Leaves acute at the base, glabrous above, white-tomentose underneath.

Cymes dense. Corolla glabrous . . . . .

1. *C. cana*.

Leaves rounded at the base, pubescent or velvety above, somewhat floccose underneath. Cymes dense. Corolla glabrous or nearly so, lilac or purple . . . . .

2. *C. pedunculata*.

Leaves acute at the base, green on both sides. Cymes very loose, Corolla densely pubescent, white . . . . .

3. *C. longifolia*.

1. ***C. cana*** (hoary), *Linn. Mant.* 198, *Benth. Fl. Austr.* v. 56. A small shrub, the tomentum close and short, usually white, slightly floccose on the older branches. Leaves petiolate, ovate, very shortly acuminate; bordered by rather broad more or less mucronate teeth, acutely narrowed at the base, 2 to 3 in. long, glabrous above when full-grown except a slight tomentum on the principal veins, membranous when large, rather firmer and more rugose when small, white-tomentose underneath. Flowers small, in rather dense cymes, the common peduncle usually about as long as the petiole. Calyx about  $\frac{3}{4}$  line long, minutely 4- or 5-toothed. Corolla glabrous, twice as long as the calyx. Stamens exserted; anthers with small glands along the connectivum. Drupe depressed-globular, not above 1 line diameter, slightly succulent, the endocarp of 4 hard nuts.—*Schau. in DC. Prod.* xi. 643; *C. adenanthera*, *R. Br. Prod.* 513.

Hab.: Gulf of Carpentaria, *R. Brown, Bowman*; Edgecombe Bay and Port Denison, *Dallachy*; Gilbert River, *Daintree*.

The species extends over the Indian Archipelago to the Malayan Peninsula and the Philippine Islands.

2. ***C. pedunculata*** (pedunculate), *R. Br. Prod.* 513; *Benth. Fl. Austr.* v. 57. A shrub of 6 or more ft., with the tomentum rather loose and more or less floccose on the branches. Leaves petiolate, ovate or ovate-lanceolate, acuminate with the point often rather long, rounded or scarcely contracted at the base, usually 3 or 4 in., soft green and velvety with scattered hairs above, more tomentose underneath but not very white. Cymes rather loose, the peduncle often shortly exceeding the petiole. Flowers of *C. cana*, the corolla purplish or lilac. Fruit usually much larger than in that species, the succulent drupes often at least  $1\frac{1}{2}$  line diameter, purple when fresh.—*C. dentata*, *Roth?* in *Wall. Cat.* n. 6319, but probably not the true plant of *Roth*; *C. lanata*, *Schau. in DC. Prod.* xi. 644, not of *Lam.*

Hab.: Northumberland Islands, Broadsound and Shoalwater Bay, *R. Brown*; Endeavour River, *A. Cunningham*; Dawson River, *F. v. Mueller*; Rockingham Bay and Rockhampton, *Dallachy* and others; Brisbane River, Moreton Bay, *W. Hill, F. v. Mueller* and others, not at all uncommon.

The species is also in the Archipelago.

3. ***C. longifolia*** (leaves long), *Lam. ex. Schau. in DC. Prod.* xi. 645, but not *C. adenanthera*, *Br.*; *Benth. Fl. Austr.* v. 57. A shrub of several ft., the tomentum short, not so abundant as in most species and rarely whitish, although sometimes reddish on the young shoots. Leaves petiolate, oblong or oblong-lanceolate, acuminate with a long point, serrate, much narrowed at the base, 4 to 6 in. or even longer, membranous, green and nearly glabrous or sprinkled with very short hairs above, more copiously tomentose and glandular underneath but usually green or very slightly rusty or whitish. Flowers white, smaller than in the other species, in very loose repeatedly forked cymes, the common peduncle scarcely exceeding the petiole, but the branches elongated and slender. Calyx about  $\frac{1}{2}$  line long. Corolla about 1 line, pubescent outside. Fruit globular, white, about 1 line diameter.

Hab.: Rockingham Bay, *Dallachy*, and other tropical localities.

The species is widely spread over the Indian Archipelago, extending into India to Khasia and East Bengal.

A few years ago I was informed by Dr. T. G. White that the Japanese living in the Johnstone River district used of the bark of this shrub as a substitute for the Betel-leaf, when chewing the Areca-nut with lime. The Cingalese are said to use the bark of *C. lanata* also for the same purpose.

Wood straw-coloured, close grained.—*Bailey's Cat. Ql Woods*, No. 297b.

## 12. PREMNA, Linn.

(From *premon*, a stump of a tree, some species being dwarf.)

Calyx truncate or sinuately toothed. Corolla-tube short, the limb of 3, 4 or rarely 5 short teeth or lobes, nearly equal or slightly 2-lipped. Stamens 4, shorter than the corolla or rarely exserted. Ovary 4-celled with 1 ovule in each cell laterally attached at or above the middle. Style filiform, with 2 short acute stigmatic lobes. Fruit a small succulent drupe, with a hard 4-celled undivided kernel. Seeds solitary in each cell, without albumen.—Shrubs or trees. Leaves opposite, undivided. Flowers small, in terminal, trichotomous panicles, or in opposite cymes or clusters forming a terminal spike-like thyrsus.

A considerable genus, limited to the tropical and subtropical regions of the Old World. Although some, especially among the Asiatic species, are very well marked, there are a number of forms including the *P. integrifolia* and *P. serratifolia* of Linnæus which seem to pass into each other by numerous intermediates, and it would require a much more detailed study of good specimens from different localities than can now be devoted to them, to determine whether or not they can be classed into tolerably distinct races. To these would belong the first two of the following Australian forms here regarded as species, the next three are rather more distinct and apparently endemic; the sixth, also endemic, is a much more marked one.

Calyx very shortly and obtusely 3-lobed or obscurely 2-lipped.

Leaves very obtuse. Corolla-tube scarcely exceeding the calyx . . . . . 1. *P. obtusifolia*.

Leaves shortly acuminate. Corolla-tube nearly twice as long as the calyx . . . . . 2. *P. integrifolia*.

Calyx with a somewhat expanded obscurely toothed margin.

Leaves acuminate, thin, glabrous, the petiole short . . . . . 3. *P. limbata*.

Calyx 5-toothed, the margin not dilated.

Leaves ovate, acuminate, on rather short petioles. "Yel" Morehead River, *Roth*. Wood used for making fire-sticks, *Roth*, l.c. . . . . 4. *P. Dallachyana*.

Leaves broad, lanceolate. Petioles rather long. Fruit verrucose when dry . . . . . 5. *P. Tateana*.

Leaves deltoid, much acuminate (Poplar-like), on long petioles . . . . . 6. *P. acuminata*.

1. ***P. obtusifolia*** (leaves obtuse), *R. Br. Prod.* 512; *Benth. Fl. Austr. v.* 58. "Ngalki" Tully River, "Mo-odo" Batavia River, *Roth*. A shrub of 3 to 6 feet, glabrous in the typical form except a minute pubescence on the inflorescence and sometimes a row of hairs along the principal veins on the underside of the leaves. Leaves broadly ovate obovate or almost orbicular, usually broadly obtuse, very rarely with a short obtuse point, cordate or very obtuse at the base, mostly 3 to 6 in. long and sometimes nearly as broad, the petiole varying from a  $\frac{1}{4}$  to 1 in. in length. Flowers white or greenish, often very numerous, in terminal trichotomous corymbose panicles, sometimes shorter than the leaves, sometimes 6 to 8 in. diameter. Bracts very small and narrow. Calyx rarely above 1 line long and usually rather shorter, obscurely and irregularly 2-lipped, or rather very shortly and broadly 3-lobed, the upper lobe broader than the others and entire or obscurely 3-toothed, the two lower lobes entire, the whole calyx spreading open under the fruit but not otherwise enlarged. Corolla-tube about as long as the calyx, very hairy inside at the throat, the limb as long as the tube, 4-lobed, the upper inner lobe rather larger and less spreading than the others. Stamens inserted in the throat and nearly as long as the lobes. Style with very short stigmatic lobes. Drupe 2 to 2 $\frac{1}{2}$  lines diameter.—*Schau. in DC. Prod.* xi. 637; *P. glycyococca*, *F. v. M. Fragm.* iii. 36.

Hab.: Islands of the Gulf of Carpentaria and shores of the mainland, *R. Brown*, *Henne*, *Hulse*; Rockingham Bay, *Dallachy*; Islands off the coast from Cape York to Cape Flattery, *F. v. Mueller*, *W. Hill*, *Henne*.

Very closely allied to some maritime forms of *P. integrifolia* but the leaves more obtuse, of a firmer consistence, and the corolla tube shorter. These characters may not, however, prove constant.—*Benth.*

The form of the pith in the stem of this is most remarkable. The central hollow or pith-tube is ribbed on the inner surface with about 14 prominent and numerous line-like ribs; to these are attached at distances of about three lines thin filmy disks or septæ of a pale-pink colour and tough consistency, which may be removed from the stem readily without injury; those of the stem noticed when thus removed measured eight lines in diameter. Wood brown.—*Bailey's Cat. Ql. Woods*, No. 298.

Wood used for spears and fire sticks, *Roth*, l.c.

Var.? *velutina*. Leaves softly tomentose, on both sides, otherwise the foliage and flowers quite those of *A. obtusifolia*—Rockingham Bay, *Dallachy*, who notes that it is a small tree with a spreading head.

2. ***P. integrifolia*** (leaves entire), *Linn?* Var.; *Benth. Fl. Austr.* v. 59; A tree or shrub, either quite glabrous or with a slight pubescence on the foliage and inflorescence. Leaves ovate, shortly acuminate, broad or rather narrow, usually rather smaller than in *P. obtusifolia*. Inflorescence and calyx entirely as in that species, but the corolla (in the Australian form) larger, the tube nearly twice as long as the calyx.—*P. ovata* and *P. melia*, R. Br. Prod. 512; Schau. in DC. Prod. xi. 637.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

The specimens I saw in Brown's herbarium did not appear to me to be at all different from some Asiatic ones of *P. integrifolia*, a very common sea-coast plant united by Schauer in DC. Prod. vi. 632 with *P. serratifolia*, Linn., under the latter name, which, however, appears to be the least appropriate of the two Linnæan ones for the consolidated species. The whole question however of the species of *Premna* requires a thorough revision.—*Benth.*

3. ***P. limbata*** (referring to the expanded calyx), *Benth. Fl. Austr.* v. 59. A climbing shrub (*Dallachy*), the young branches and inflorescence minutely tomentose. Leaves ovate, mostly acuminate, rounded or broadly cordate at the base, 4 to 6 in. long, membranous, glabrous or pubescent along the veins underneath, the petioles 1 in. long or more. Panicles trichotomous, but not so spreading as in *P. obtusifolia* and the flowers larger, the pedicels often above 1 line long. Calyx fully 1 line long, the margin slightly expanded into broad very short obtuse or retuse teeth. Corolla-tube twice as long as the calyx, the upper inner lobe not much larger than the others.

Hab.: Rockingham Bay, *Dallachy*.

4. ***P. Dallachyana*** (after J. Dallachy), *Benth. Fl. Austr.* v. 59. "Yel." Morehead River, *Roth*. A fine spreading shrub (*Dallachy*), the younger branches and inflorescence minutely tomentose, the older branches glabrous with a light coloured bark, the foliage usually drying black. Leaves ovate, acuminate, entire, obtuse or narrowed at the base, mostly 2 to 3 in. long, glabrous or scarcely pubescent along the principal veins underneath. Panicles trichotomous, corymbose, not large. Calyx scarcely 1 line long, more or less distinctly 5-toothed, the teeth very short, acute or obtuse but not dilated. Corolla-tube twice as long as the calyx and considerably dilated upwards, hairy inside at the throat, the lobes broad, the upper inner one larger than the others but entire. Stamens usually longer than the corolla. Drupe depressed-globular, not usually exceeding the calyx.

Hab.: Port Denison and in the scrub about Edgcombe Bay, *Dallachy*; Fort Cooper, *Boorman*. The calyx-lobes are more obtuse and irregular in the Edgcombe Bay specimens than in the others.

Wood used for making fire-sticks.—*Roth*, l.c.

5. ***P. Tateana*** (after T. Tate, botanic collector of Hann's Expedition), *Bail. Bot. Bull.* iv. A tall shrub, bark light-coloured, striated and more or less covered with scattered verrucæ. Leaves glabrous, broad lanceolate, of thin



texture, 3 to 5in. long, some exceeding 2in. wide in the centre, on slender petioles of  $\frac{1}{2}$  to  $1\frac{1}{2}$ in., margins entire, primary veins few, about 4 on each side of the prominent midrib, the veinlets fine and numerous between them. Flowers small in terminal trichotomous corymbose panicles, the common peduncle not exceeding 1in. in length, the branches, branchlets, and calyxes clothed with short scabrous hairs. Calyx 5-toothed, scarcely 1 line long, expanding and becoming more or less 2-lipped, ribbed and nearly glabrous under the fruit. Corolla twice as long as the calyx, lobes obtuse, very hairy inside as well as the upper part of the tube. Drupe globular, 3 lines diameter, the putamen prominently verrucose, plainly showing on the dry fruit.

Hab.: Walsh River, *T. Barclay-Millar*.

In many respects this species approaches *P. Dallachyana*, Benth., but no reference is made in the description of that species to the very prominent feature—the verrucose fruit—which would never have escaped detection by Mr. Benthams, in drawing up the diagnosis of that species for the flora. Its nearest ally would seem to be the Indian species *P. latifolia*, Roxb. The notice given of the leaves of various *Premnas* drying black is not worthy of note, for if dried quickly they retain a green colour, but if allowed to become damp will turn black.

6. ***P. acuminata*** (leaves acuminate), *R. Br. Prod.* 512; *Benth. Fl. Austr.* v. 60. A small tree of spreading habit, the inflorescence and foliage more or less hoary with a short close tomentum. Leaves broadly cordate-ovate, deltoid or almost rhomboidal, acuminate, entire or coarsely and irregularly toothed, 2 to 4in. long, more or less pubescent or tomentose on both sides, 3- or 5-nerved (the first and often the second pair of primary veins starting from the base of the midrib), the petioles usually more than half as long as the leaves. Panicles very loose, the primary branches trichotomous, the ulterior ones dichotomous, the whole panicle sometimes 8 to 10in. broad. Flowers nearly sessile. Calyx tomentose, nearly  $1\frac{1}{2}$  line long, shortly and obtusely 5-toothed but the 3 upper teeth usually smaller and sometimes united as in *P. obtusifolia*. Corolla-tube shortly exserted, the lobes ovate, shorter than the tube, the upper inner one not very different from the others. Drupe depressed-globular, about 2 lines diameter.—*Schau. in DC. Prod.* xi. 637; *F. v. M. Fragin.* iii. 36; *P. cordata*, *R. Br. l. c.*; *Schau. l. c.*

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

The species is readily distinguished by its Poplar-like foliage and loose inflorescence.

### 13. GMELINA, Linn.

(After S. Gmelin, a German naturalist.)

Calyx 4, or 5-toothed or sinuate-lobed. Corolla-tube much dilated upwards or almost campanulate; limb oblique, with 4 or 5 spreading lobes, the two upper ones sometimes united in an upper lip. Stamens 4, in pairs, shorter than the corolla. Ovary 4-celled with 1 ovule in each cell laterally attached at or above the middle; style filiform, unequally 2-lobed at the top. Fruit a succulent drupe, the putamen hard or bony, 4-celled or rarely 2-celled. Seeds solitary in each cell, without albumen.—Trees or tall shrubs. Leaves opposite, undivided. Flowers often rather large, pale purplish pink or blue, or in species not Australian yellow, in cymes arranged in irregular terminal panicles, sometimes almost reduced to simple racemes. Bracts small.

The genus extends over tropical Asia and the Indian Archipelago. The Australian species, although with the aspect of some Asiatic ones, appear to be all endemic.—*Benth.*

Leaves glabrous (above 6in.). Panicles long and narrow. Cymes pedunculate . . . . .	1. <i>G. macrophylla</i> .
Leaves glabrous (under 6in.). Cymes forming sessile clusters along the rachis of the panicle or of its branches . . . . .	2. <i>G. fasciculiflora</i> .
Leaves tomentose-underneath. Cymes pedunculate in a loosely pyramidal panicle . . . . .	3. <i>G. Leichhardtii</i> .

1. **G. macrophylla** (large-leaved), *Benth. Fl. Austr.* v. 65. A tall tree, glabrous except the inflorescence, which is slightly tomentose. Leaves ovate or ovate-oblong, obtuse, broad, and sometimes almost cordate at the base, 8 to 18 in. long, 9 in. broad, coriaceous and glabrous but not shining, on petioles of 1 to 2 in. long, bearing at base of lamina 2 or more flat glands. Flowers pale-blue, in a long terminal thyrsoid panicles, the cymes on opposite peduncles, the pedicels very short. Calyx campanulate, about 2 lines long, truncate or sinuate-lobed, scarcely enlarged or sometimes slightly expanded under the fruit. Corolla villous outside with appressed hairs, the tube declinate and much dilated upwards, about  $\frac{1}{2}$  in. long, lobes 5, broad, about  $\frac{1}{4}$  in. long, the middle lower one rather larger than the others. Stamens ascending under the upper lobes, anther-cells diverging. Ovary glabrous, 4-celled. Upper lobe of the style minute. Drupe obovoid-truncate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, closely resembling that of *G. arborea*.—*Vitex macrophylla*, R. Br. Prod. 512, Schau. in DC. Prod. xi. 695; *Vitex Dalrympleana*, F. v. M. Fragn. iv. 128; v. 72; *Ephielis simplicifolia*, Seem. Fl. Vit. 189.

Hab.: Islands of Torres Straits; Cape Grafton, *Banks and Solander*; Cape York, *Daemel*; Rockingham Bay, *Dallachy*.

Wood close grained, the outer or sapwood prominently marked, of a pretty purple colour, the rest grey. A useful timber for flooring boards and planking, the timber closely resembles that *G. Leichhardtii*.—*Bailey's Cat. Ql. Woods*, No. 298a.

2. **G. fasciculiflora** (referring to clusters of flowers), *Benth. Fl. Austr.* v. 65. "Toeah," Barron River, *J. F. Bailey*. A tall tree, nearly glabrous except the inflorescence which is ferruginous-tomentose. Leaves ovate, obtuse or obtusely acuminate; usually broad, 3 to 5 in. long, somewhat coriaceous, shining above, the primary veins much raised underneath but not nearly so reticulate as in *G. Leichhardtii*. Cymes reduced to dense opposite clusters sessile along the branches of a terminal panicle, the floral leaves at the base of the clusters reduced to broad bracts shorter than the calyxes. Pedicels very short. Calyx broadly campanulate, ferruginous-villous, about 2 lines long, truncate or more or less distinctly-toothed. Corolla pale purple, villous, the tube short but much more dilated and oblique than in *G. Leichhardtii*, the lower lip fully  $\frac{1}{2}$  in. long, with a large broad middle lobe, the upper lobes all broad but much shorter than the lowest. Fruit not seen.—*Vitex Leichhardtii*, var. *glabrata*, F. v. M.

Hab.: Rockingham Bay, *Dallachy*, and other tropical scrubs.

3. **G. Leichhardtii** (after L. Leichhardt), *F. v. M. Benth. Fl. Austr.* v. 66. Queensland Beech. "Cullounen," Mooloolah, *Pettigrew*. A fine timber tree, attaining a great height, the young branches and inflorescence tomentose. Leaves ovate, scarcely acuminate, but rather acuminate, rounded or cuneate at the base, 3 to 6 in. long, somewhat coriaceous, quite glabrous and almost rugose on the upper side, much reticulate with raised veins and densely and softly tomentose underneath, the petiole often above 1 in. long. Flowers white with purple markings, numerous in opposite pedunculate cymes forming loose ovoid or shortly pyramidal terminal panicles. Calyx broadly turbinate-campanulate, truncate, tomentose and not 2 lines long at the time of flowering, enlarged and spreading under the fruit. Corolla villous outside, the tube very broad and dilated upwards, twice as long as the calyx, the lobes ovate, above 2 lines long, the 2 upper ones rather larger and shortly united in an upper lip. Stamens incurved, the longer pair about as long as the upper lip; anther-cells diverging. Fruit about 1 in. diameter, usually ripe about March, the calyx opening out horizontally to a diameter of 6 to 8 lines and obscurely sinuate-toothed.—*Vitex Leichhardtii*, F. v. M. Fragn. iii. 58.

Hab.: Myall Creek, *Leichhardtii*; Moreton Bay, *W. Hill*, *Queensland Woods*, *London Exhibition*, 1862, n. 30; Pine River, *Fitzalan*.

Wood light-grey, close grained; extensively used for planking for ships decks and flooring of verandahs. Is not readily attacked by the white ant.—*Bailey's Cat. Ql. Woods*, No. 299.

## 14. VITEX, Linn.

(A name used by Pliny, for this or some similar shrub.)

Calyx 5-toothed or lobed. Corolla-tube short; limb spreading, 5-lobed, the lowest lobe larger and longer than the others and sometimes notched. Stamens 4, in pairs, ascending and exserted beyond the upper corolla-lobes. Ovary 2-celled or more or less perfectly 4-celled, with 1 ovule to each half-cell or cell, laterally attached at or above the middle. Style filiform, shortly and acutely 2-lobed. Fruit a succulent drupe, the putamen separating into 4 hard one-seeded pyrenes (or fewer by abortion). Seeds without albumen.—Trees or shrubs. Leaves opposite, usually of 3 or 5 digitate leaflets, very rarely single (or of a single leaflet). Flowers in cymes, sometimes axillary but usually in terminal panicles either simple and spike-like or branched. Bracts very small.

A considerable tropical and subtropical genus, chiefly Asiatic or African with a few American species, and one species extending to S. Europe. Of the four Queensland species, one is widely spread over the Old World within the tropics, another extends to India and China, and the other two are endemic.

Leaves white underneath, undivided or of 3 or 5 leaflets . . . . . 1. *V. trifolia*.  
 Leaves green on both sides, undivided . . . . . 2. *V. lignum vitæ*.  
 Leaves green on both sides, of 3 or 5 leaflets.

Flowers in loose thyrsoid panicles, mostly terminal . . . . . 3. *V. acuminata*.

Flowers in very loose dichotomous cymes on axillary peduncles . . . . . 4. *V. glabrata*.

1. **V. trifolia** (leaves of 3 leaflets), Linn.; Schau. in DC. Prod. xi. 683; Benth. Fl. Austr. v. 66. A shrub or small tree or sometimes decumbent and low, in some varieties tall and erect, the branches, under side of the leaves and inflorescence mealy-white. Leaves very variable, simple or of 3 or 5 leaflets often white on both sides, but usually becoming nearly glabrous on the upper side at least when old. Flowers nearly white or pale blue, in small nearly sessile opposite cymes, forming short terminal panicles, either simple and spike-like or slightly branched, the floral leaves reduced to short bracts. Calyx in the typical forms about 2 lines long, very shortly 5-toothed, the corolla-tube nearly twice as long as the calyx, the 4 upper lobes short, the lowest twice as large and often as long as the tube and both calyx and corolla more or less mealy outside. Ovary 2-celled, with 2 ovules in each cell. Drupe globular, 3 to 4 lines diameter, black.—Rumph. Herb. Amb. iv. t. 18; Rheede Hort. Mal. ii. t. 11.

Hab.: Islands of the Gulf of Carpentaria, Henne; along the coast from Cape York to Moreton Bay, R. Brown, A. Cunningham, F. v. Mueller, Dallachy, and many others.

Wood a dark-grey, firm and close in grain.—Bailey's Cat. Pl. Woods, No. 299A.

The species is a very common Asiatic one, chiefly maritime, and varying very much as to foliage, the three following principal Queensland forms agreeing more or less with Asiatic varieties, but some of them passing into species which in Asia has been considered as perfectly distinct.

1. *obovata*. Decumbent. Leaflets (or simple leaves) mostly solitary, obovate or rounded, 1 to 1½ in. long, rarely, especially on flowerless branches, 3-foliate and less obtuse. A strictly maritime variety in the colony as in tropical Asia.—*V. ovata*, Thunb., Hook. and Arn. Bot. Beech. 206, t. 47, R. Br. Prod. 511.

2. *acutifolia*. Decumbent or erect. Leaflets 3 or sometimes 5 or only 1, ovate or ovate-lanceolate, acute or acuminate, the middle one often above 2 in. long.—*V. trifolia*, R. Br. Prod. 511.—Common along the coast and appears to be not so strictly maritime as the obovate-leaved form.

3. *parviflora*. Erect. Leaflets 5 or sometimes 3 ovate or ovate-lanceolate, acute. Flowers much smaller than in the two preceding forms, and resembling those of the Asiatic *V. Negundo*, from which this variety is scarcely to be distinguished.—Gulf of Carpentaria to Moreton Bay.

There are numerous intermediate specimens connecting the above three principal forms.—Benth.

2. **V. lignum-vitæ** (timber called *lignum-vitæ*), A. Cunn. Schau. in DC. Prod. xi. 692; Benth. Fl. Austr. v. 67. A tall handsome tree, the young branches petioles and inflorescence rusty-tomentose or pubescent. Leaves all simple (or unifoliate?), oblong or oval-elliptical, shortly acuminate, narrowed

at the base,  $1\frac{1}{2}$  to 4 in. long on a petiole of  $\frac{1}{4}$  to  $\frac{1}{2}$  in., somewhat coriaceous, shining on the upper side, paler underneath, conspicuously veined, quite glabrous or with a slight pubescence on the midrib underneath, those of barren branches sometimes broadly and unequally lobed, those of flowering branches usually entire but occasionally showing a few prominent angles or short-lobes. Flowers few, in small loose axillary cymes. Calyx truncate, about 1 line long or rather more, rarely tomentose. Corolla tomentose outside, the tube 3 to 4 lines long, broad and incurved, the middle lower lobe not exceeding the others so much as in some species. Stamens shortly exerted beyond the upper lobes.—F. Muell. Fragm. iii. 58. Fruit globose, red, about 9 lines diameter.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *W. Hill*, *F. v. Mueller*, *C. Moore*. *Queensland Woods, London Exhibition, 1862, n. 29.*

Wood dark, close-grained, hard and tough, suitable for cabinet work.—*Bailey's Cat. Ql. Woods, No. 300.*

3. **V. acuminata** (leaves acuminate), *R. Br. Prod.* 512; *Benth. Fl. Austr.* v. 67. A small or large tree, the young shoots and inflorescence more or less hoary-pubescent, the adult leaves glabrous or nearly so. Leaflets 3 or rarely 5, ovate-oblong, elliptical or almost lanceolate, mostly acuminate, contracted at the base into a petiolule, sometimes very short, sometimes  $\frac{1}{4}$  in. long, the terminal leaflets often 3 to 4 in. long or even more, the lateral ones usually shorter, all membranous, green on both sides, paler and usually glandular-dotted underneath, the common peduncle usually shorter than the leaflets. Flowers small, in loose thyrsoid panicles of 2 to 4 in., terminal or in the upper axils. Pedicels very short. Calyx 1 to  $1\frac{1}{4}$  line long, truncate or minutely toothed. Corolla pubescent outside, villous inside in the throat and the base of the limb, the tube about twice as long as the calyx, the lower lip nearly as long as the tube. Stamens shortly exerted beyond the upper lobes. Ovary 2-celled, with 2 ovules in each cell. Drupe red, nearly globular, about  $\frac{1}{2}$  in. diameter, the putamen bony and 4-celled as in *Gmelina*.—*Schau. in DC. Prod.* xi. 695; *F. v. M. Fragm.* v. 34; *V. melicopea*, *F. v. M. Fragm.* v. 35.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Cape York, *M'Gillivray*, *W. Hill*, *Dacmel*; Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy*; Mount Elliot and Mount Dryandra, *E. Fitzgerald*.

Wood brown with darker streaks, close-grained; suitable for cabinet work.—*Bailey's Cat. Ql. Woods, No. 301.*

*V. Timoriensis*, Walp.; *Schau. in DC. Prod.* xi. 686, from Timor, may be the same as *V. acuminata*.—*Benth.*

4. **V. glabrata** (glabrous), *R. Br. Prod.* 512; *Benth. Fl. Austr.* v. 68. "Ko-na-ru," Cooktown, *Roth*. A tree or shrub, quite glabrous or rarely with a minute tomentum on the young shoots and inflorescence. Leaflets 3 or rarely 5, from broadly ovate and obtuse to elliptical-oblong and acuminate, 2 to 4 in. long, but usually much broader than in *V. acuminata* and less narrowed at the base, the petiolules about  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, and the common petiole above 2 in. Flowers white, rather small, in very loose dichotomous cymes on axillary peduncles sometimes nearly as long as the petiole, but the whole inflorescence almost always shorter than the leaf. Pedicels shorter or rarely longer than the calyx. Calyx about  $1\frac{1}{4}$  line long, truncate or minutely toothed. Corolla-tube at least twice as long as the calyx, and the lower lip nearly as long as the tube. Stamens shortly exerted beyond the upper lobes. Fruit black, 4-celled, often only maturing 1 or 2 seeds, obovoid, about  $\frac{1}{2}$  in. long.—*Schau. in DC. Prod.* xi. 695; *V. Cunninghamii*, *Schau. l. c.* 691.

Hab.: Groot Island, Gulf of Carpentaria, *R. Brown*; Cape York, *Dacmel*; Gilbert River, *Daintree*, and other tropical scrubs.

The species extends to India and Cochin-China.—*C. B. Clark*, in *Hook. Fl. Brit. Ind.* iv. 588. Fruit eaten.—*Roth*.

## 15. FARADAYA, F. v. M.

(After M. Faraday.)

Calyx closed before flowering, then dividing into 2 valvate segments. Corolla-tube dilated upwards, limb 4-lobed, the upper lobe broad and emarginate, the three lower nearly equal. Stamens 4, didynamous, exserted. Ovary shortly 4-lobed, 4-celled in the upper portion, with one ovule in each cell laterally attached. Fruit a drupe, the putamen 1-celled and 1-seeded by abortion (or 4-lobed with 4-distinctive pyrenes?).—Woody climbers. Leaves opposite, undivided. Flowers rather large, in terminal panicles.

Besides the Australian species, there are three from the S. Pacific Islands. The nearest affinity of the genus appears to be with the New Caledonian *Oxera*.—*Benth.*

1. **F. splendida** (alluding to its handsome flowers), *F. v. M. Fragm.* v. 21, 212; *Benth. Fl. Austr.* v. 69. "Buku," Tully River, *Roth.* A tall woody climber, quite glabrous. Leaves ovate, acuminate, rounded or cordate at the base, 6in. to nearly 1ft. long, prominently pinniveined, and with glands on the base of blades, the petiole 1 to 2in. long. Flowers large, white, in a terminal corymbose panicle. Bracts small, subulate. Pedicels  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long. Calyx before expanding obovoid and acuminate, dividing into 2 acuminate segments 8 to 10 lines long. Corolla-tube above 1in. long, the lobes flat, nearly  $\frac{3}{4}$ in. long. Filaments sprinkled with hairs below the middle, inserted in the throat of the corolla; anthers with 2 parallel cells. Ovary tomentose, 4-lobed. Drupe the size and colour of a hen's egg, 1-seeded, contracted at the base, proceeding from one lobe of the ovary, the other lobes remaining abortive at the base, epicarp fleshy, endocarp corky.

Hab.: In most tropical scrubs.

Wood of a brownish colour, coarse in grain.—*Bailey's Cat. Ql. Woods*, No. 301 bis.

Outer bark stripped used as a fish-poison.—*Roth.*

## 16. CLERODENDRON, Linn.

(Referring to its uncertain medicinal properties.)

Calyx campanulate or inflated, 5-toothed or 5-lobed, enlarged and spreading under the fruit (except in *C. hemiderma* and in some species not Australian). Corolla-tube slender, often very long; limbs spreading nearly equally 5-lobed. Stamens 4, exserted and often very long. Ovary 4-celled, with 1 ovule in each cell laterally attached at or above the middle. Style filiform, with 2 short acute stigmatic lobes. Fruit a more or less succulent or almost dry drupe, the endocarp separating into 4 one-celled or rarely into 2 two-celled pyrenes.—Trees or shrubs or rarely herbs or woody climbers. Leaves opposite or in whorls. Flowers in loose heads or cymes, usually forming terminal corymbose or thyrsoid panicles or rarely axillary.

A considerable tropical genus, chiefly Asiatic, with a few African or American species. Of the Australian species—which are here limited to eight, but might almost equally well be raised to ten or eleven, or reduced to four or five—one is a sea coast plant widely spread over tropical Asia, the others appear to be endemic.—*Benth.*

Calyx minutely toothed.

Woody climber. Flowers small in compact cymes. Corolla-tube 3 lines

long. Fruit oblong, pubescent, small . . . . . 1. *C. hemiderma*.

Erect shrub. Flowers few in axillary loose cymes. Corolla-tube 1in.

long. Fruit obovoid, glabrous, rather large . . . . . 2. *C. inerme*.

Calyx 5-lobed to the middle.

Corolla-tube about 3 lines long. Stamens shortly exserted. Leaves

large and broad . . . . . 3. *C. Tracyanum*.

Corolla-tube  $\frac{3}{4}$  to nearly 1in. long. Stamens long. Leaves usually

tomentose.

Leaves usually broad. Flowers mostly in dense terminal corymbs . . . . . 4. *C. tomentosum*.

Leaves usually narrow. Flowers mostly in axillary cymes . . . . . 5. *C. lanceolatum*.

- Corolla tube 1 to 1½ in. long. Stamens long. Leaves usually glabrous or tomentose only when young . . . . . 6. *C. floribundum*.  
 Corolla-tube 2 in. long or more. Stamens long. Leaves of *C. floribundum* . . . . . 7. *C. Cunninghamii*.  
 Species insufficiently known, with broad tomentose, very rugose leaves . . . . . 8. *C. costatum*.

1. **C. hemiderma** (half-skinned), *F. v. M.*; *Benth. Fl. Austr.* v. 61. A tall woody climber, the young parts and inflorescence more or less hoary-pubescent, the leaves becoming glabrous when full-grown. Leaves shortly petiolate, broadly ovate, obtuse or shortly and obtusely acuminate, mostly 2 to 3 in. long, green on both sides. Flowers small for the genus, numerous, in rather compact trichotomous cymes either terminal or on short branches or leafless divaricate peduncles in the upper axils. Primary bracts sometimes oblong-lanceolate and contracted into a petiole, but most of them very small and narrow. Calyx shortly pedicellate, narrow-campanulate or obovoid, about 1½ lines long, with 5 minute teeth. Corolla-tube slender, shortly exserted but not exceeding 3 lines, glabrous inside; lobes about half as long as the tube, more or less silky-pubescent outside. Stamens about twice as long as the corolla-lobes. Fruiting calyx often above 2 lines long but remaining narrow. Fruit oblong, obtuse, pubescent, or hirsute, 3 to 4 lines long, 4-celled in the upper portion where the endocarp closes round the seeds and separates into 4 narrow nuts, the lower seedless portion assuming the appearance of a wing to each nut, whilst the lower portion of the dissepiment remains attached to the receptacle after the nuts have fallen in a cuneate-oblong shape three-toothed at the top and nearly as long as the calyx.—*C. (Hemiderma) Linnai*, *F. v. M. Fragm.* vi. 151, not of Thwaites.

Hab.: Cape York, *Daemel*; Rockingham Bay, *Dallachy*; Selheim River, *Bowman*; Rockhampton, *Thozet*; Gilbert River, *R. Daintree*.

This plant has a singular resemblance with the Cingalese *C. Linnai*, Thw. which has the same climbing habit, foliage, and inflorescence, but rather larger flowers, the outer bracts much larger, broader, and foliaceous, and the fruit, although nearly similar in shape, is much more normal, without the flat winglike bases of the nuts or the persistent axis upon which *F. v. Mueller* has founded his sectional character of *Hemiderma*.—*Benth.*

2. **C. inerme** (unarmed), *R. Br. Prod.* 511; *Benth. Fl. Austr.* v. 61. "Ta-anji," Batavia River, *Roth*. A shrub attaining 8 ft. or more, glabrous or the young shoots slightly pubescent, the branches sometimes dilated and hardened at the base of the leaves, but not spinescent. Leaves on rather long petioles, ovate or elliptical, obtuse or shortly acuminate, entire, mostly 2 to 3 in. long. Peduncles axillary, often nearly as long as the leaves, bearing usually 3, but sometimes a cyme of 7 or even more pedicellate flowers. Bracts minute. Calyx campanulate, slightly dilated on the margin, truncate and minutely toothed, more open and 3 lines long when in fruit. Corolla-tube about 1 in. long, the lobes about 4 lines. Stamens protuding about 1 in. beyond the throat. Drupe obovoid, usually about ½ in. long, but sometimes much larger, the exocarp thick and spongy or almost corky, with a crustaceous endocarp. Seeds with thick cotyledons and a very short radicle.—*Schau.* in *DC. Prod.* xi. 660.

Hab.: Islands of the Gulf of Carpentaria, *R. Brocu*; Bay of Inlets and Endeavour River, *Banks* and *Solander*; frequent along the coast from Cape York to Rockhampton, *A. Cunningham*, *M'Gillivray*, *F. v. Mueller*, *Dallachy*, and many others.

Wood light-coloured, firm and close-grained.—*Bailey's Cat. Ql. Woods*, No. 301a.

Fruit eaten and wood used for fire-sticks.—*Roth*.

3. **C. Tracyanum** (after Dr. R. T. Tracy), *F. v. M.*, *Benth. Fl. Austr.* v. 62. A tall shrub or small tree, rather bare of foliage, the young branches foliage and inflorescence more or less velvety-pubescent or hirsute. Leaves broadly ovate, shortly acuminate, rounded or broadly cordate at the base, 4 to 8 in. long or more, on petioles of 1 to 4 in. Flowers in terminal trichotomous cymes, very dense at the time of flowering, 3 to 4 in. diameter when in fruit. Bracts very

small and deciduous. Calyx shortly pedicellate, villous outside glabrous inside, turbinate-campanulate and about  $2\frac{1}{2}$  lines long at the time of flowering, divided to near the middle into acute lobes, enlarged and coloured after flowering, in some specimens with the fruit apparently ripe broadly campanulate and about 4 lines diameter, in others still more enlarged and opening almost flat to about 5 lines diameter. Corolla-tube above 3 lines long, slender, and the 5 lobes of the limb nearly equal and spreading as in the rest of the genus. Stamens rather longer than the corolla-lobes. Drupe succulent, 3 to 4 lines diameter, enclosing 4 distinct 1-seeded pyrenes.—*Premna Tracyana* or *Vitex Tracyana*, F. v. M. Fragn. v. 61.

Hab.: Rockingham Bay, *Dallachy*.

Although the flowers are small, their structure and that of the fruit appears to me to be entirely those of *Clerodendron*, and not at all those of *Premna* or *Vitex*.—*Benth.*

Wood of a grey colour, easy to work.—*Bailey's Cat. Ql. Woods*, No. 301b.

4. **C. tomentosum** (tomentose), *R. Br. Prod.* 510; *Benth. Fl. Austr.* v. 62. A tall shrub or small tree, the foliage and inflorescence usually velvety-pubescent, the older leaves rarely quite glabrous. Leaves on rather long petioles, ovate elliptical or almost lanceolate, shortly acuminate, acute or rarely rounded at the base, 2 to 4 in. long. Flowers in the normal state numerous, in compact terminal corymbs, with rarely a few peduncles bearing small cymes in the upper axils. Calyx campanulate, softly pubescent, about 3 lines long when in flower, divided to about the middle into acute or rather obtuse lobes. Corolla-tube under 1 in. long, the lobes 3 to 4 lines. Stamens protruding by from  $\frac{1}{2}$  to 1 in. Fruiting calyx expanding to  $\frac{3}{4}$  in. diameter, the drupe black and shining.—*Andr. Bot. Rep.* t. 607; *Bot. Mag.* t. 1518; *Schau. in DC. Prod.* xi. 662.

Hab.: Brisbane River, and many other localities; Gulf of Carpentaria, *R. Gull*.

Wood of a yellow colour, close grained, light and easy to work.—*Bailey's Cat. Ql. Woods*, No. 302.

Var. ? *mollissima*, very softly villous, referrible perhaps to *C. lanceolatum*, but with the broader leaves and terminal inflorescence of *C. tomentosum*.

Ventenat's plate of *Volkameria tomentosa*, *Jard Malm.*, t. 84, represents an abnormal garden state, flowering very sparingly in the upper axils, connecting this species as well with the following *C. lanceolatum* as with some pubescent small-flowered forms of *C. floribundum*.—*Benth.*

5. **C. lanceolatum** (leaves lanceolate), *F. v. M. Fragn.* iii. 145; *Benth. Fl. Austr.* v. 63. A tall shrub or small tree, the foliage and inflorescence softly velvety-pubescent or glabrous. Leaves on rather long petioles, lanceolate or ovate-lanceolate, acute or rather obtuse, 2 to 3 in. long. Cymes in the upper axils several-flowered, shorter than the leaves, on short peduncles. Bracts narrow, acute, or the outer ones more leafy. Calyx broadly campanulate about  $2\frac{1}{2}$  lines long when in flower, divided to near the middle into obtuse lobes. Corolla usually pubescent outside, the tube about  $\frac{3}{4}$  in. long or rather more, the lobes scarcely 3 lines. Stamens rather long. Fruiting calyx enlarged, coloured, very open, 4 to 5 lines diameter, the lobes recurved. Drupe depressed globular or oblong, 4 to 5 lines long, nearly or quite black when ripe.

Hab.: Coomboolaroo, *Mrs. G. Barnard*; Torrens, near White Mountains, *R. C. Burton*; and other northern localities.

The leaves are narrower in most of the glabrous specimens than in the pubescent ones. The species is not very definitely separated from *C. tomentosum*.—*Benth.*

6. **C. floribundum** (free-flowerer), *R. Br. Prod.* 511; *Benth. Fl. Austr.* v. 63. "Thurkoo," Cloncurry, *Palmer*. A tall shrub or small tree, usually quite glabrous or the young parts tomentose. Leaves on rather long petioles, usually ovate or elliptical, but varying from broadly ovate and cordate to lanceolate, obtuse acute or acuminate; acute rounded or cordate at the base, usually 2 to 3 in. long but sometimes twice

as large. Cymes sometimes all loose and few-flowered in the upper axils, sometimes forming a broad terminal corymbose panicle. Flowers to the naked eye apparently glabrous, but often sprinkled with a minute pubescence visible under a lens. Calyx  $2\frac{1}{2}$  to 3 lines long, more acute at the base than in *C. tomentosum*, the lobes acute, about as long as the tube or rather shorter. Corolla-tube usually from 1 to  $1\frac{1}{4}$  in. long, but sometimes longer, the lobes short in proportion. Stamens exserted by about 1 in. Fruiting-calyx expanding to above  $\frac{1}{2}$  in. diameter, with a narrow base of 1 to 2 lines, the drupe black and shining.—Schau. in DC. Prod. xi. 671.

Hab.: Islands of the Gulf of Carpentaria, *Henne*; Endeavour River, *Banks and Solander*; Harvey's Islands, Keppel Bay and Northumberland Islands, *R. Brown*; Percy Island and Port Curtis, *McGillivray*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy* and others; in the interior, *Mitchell*.

The species is exceedingly variable. In general it is to be distinguished from *C. tomentosum* by the absence of pubescence, more acute calyxes, longer flowers and looser inflorescence. Sometimes the inflorescence approaches that of *C. inermis*, more frequently it is at least on the main branches almost as abundant as in *C. Cunninghamii*.

*C. oratum*, R. Br. Prod. 511, Schau. in DC. Prod. xi. 671, or *C. cardiophyllum*, F. v. M. Fragm. iii. 144. is a form with large, very broad, somewhat coriaceous leaves and loose inflorescence, which may at first sight appear very distinct, but there are quite as many specimens which might equally well be referred to this or to some of the commoner varieties.—*Benth.*

Wood close-grained and light coloured.—*Bailey's Cat. Ql. Woods*, No. 302A.

Two dried sticks of this plant are used by the aborigines to make fire with.—*E. Palmer*.

7. ***C. Cunninghamii*** (after Allan Cunningham), *Benth. Fl. Austr.* v. 64. A tall shrub, either quite glabrous or the underside of the leaves and inflorescence more or less tomentose. Leaves ovate, scarcely acuminate, often narrowed at the base, sometimes above 6 in. long and membranous, sometimes much smaller and firmer, the petiole varying from under 1 in. to above 2 in. Flowers numerous in a broad terminal corymb sometimes dense sometimes loose, with the calyx and structure nearly of *C. floribundum*, but remarkable for the long slender corolla-tube, usually exceeding 2 in., the lobes broad, not above 3 lines long. Stamens rather long. Fruiting-calyx more or less funnel-shaped, shortly contracted at the base, the margins very spreading or recurved. Drupe 4 or 5 lines diameter, ripening 2 to 4 distinct pyrenes.

Hab.: Cape York, *Daemel, Jardine*; Endeavour River, *A. Cunningham*; and other northern localities.

8. ***C. costatum*** (ribbed), *R. Br. Prod.* 511; *Benth. Fl. Austr.* v. 64. A tall shrub. Leaves very broadly ovate, obtuse, 4 to 5 inches long, reticulate-rugose and velvety-tomentose underneath. Inflorescence a terminal corymbose panicle, not exceeding the leaves but looser than in *C. tomentosum*. Flowers not seen. Fruiting calyx enlarged and drupe of *C. floribundum*.—Schau. in DC. Prod. xi. 671.

Hab.: Endeavour River, *Banks and Solander*.

The foliage is that of *Gmelina Leichhardtii*, but the fruit undoubtedly that of *Clerodendron*, and not of *Gmelina*.—*Benth.*

## 17. AVICENNIA, Linn.

(After Abu Ben Sina (*Avicenna*), the celebrated Arab physician, of Bokahara, who died A.D. 1037.

Calyx divided to the base into 5 distinct segments or sepals. Corolla-tube short and broad; limb of 4 nearly equal spreading lobes or the upper one rather larger. Stamens 4, inserted in the throat, with the anthers slightly protruding. Ovary 1-celled, with 4 ovules collaterally suspended from a central column, which has 4 angles between the ovules, imperfectly dividing the ovary into 4 cells. Fruit a compressed capsule, the pericarp opening in 2 valves. Seed solitary,



erect, without integuments (the integuments of the ovule not developed); embryo with 2 very large cotyledons folded longitudinally, a very hairy radicle, and a prominent plumule, which germinates before the fruit drops off as in *Rhizophora*, &c.—Shrubs. Leaves opposite, undivided. Flowers in small cymes in the upper axils or in terminal panicles.

The genus consists of very few species, widely distributed over the warmer maritime regions of the New and the Old World, and very nearly related to each other. The Australian species is the typical and most common form.—*Benth.*

1. **A. officinalis** (officinal), *Linn.*: *Schau. in DC. Prod.* xi. 700; *Benth. Fl. Austr.* v. 69. White Mangrove. "Egaie," Cleveland Bay, "Tagon Tagon," Rockhampton, *Thozet*. "E-pumer-an," Red Island, *Roth*. "Rdai-ite," Batavia River, *Roth*. "Parpoon," Cooktown, *Roth*. "Tchuntchee," Stradbroke Island, *Watkins*. "Bootharoo," Forest Hill, *Macartney*. A small tree, the branches inflorescence and under side of the leaves white or silvery with a very close tomentum, more silky on the flowers, the upper side of the leaves usually glabrous when full-grown, black and shining when dry. Leaves coriaceous, usually lanceolate or ovate-lanceolate, 2 to 3 in. long, acute and contracted into a petiole, but varying to elliptical or obovate, and very obtuse. Cymes contracted into small heads on rigid angular peduncles, which are often 2 together in the upper axils or several in a small terminal leafy thyrus. Bracts shorter than the sepals. Sepals orbicular or broadly ovate, concave, hirsute, and ciliate, about  $1\frac{1}{4}$  line long. Corolla-tube shorter than the sepals, lobes ovate, rather longer than the tube, the upper inner one rather larger than the others. Ovary very hairy.—*A. tomentosa*, *Jacq.*; *R. Br. Prod.* 518; *Schau. in DC. Prod.* xi. 699; *Wall. Pl. As. Rar.* t. 271; *Wight, Ic.* t. 1481; *Rumph. Herb. Amb.* iii. t. 76; *Rheede Hort. Mal.* iv. t. 45.

*Hab.*: The species extends along the sea-coast all round the Australian continent, *R. Brown* and many others, and New Guinea, but not in Tasmania. It is a common sea-coast tree or shrub in tropical Asia, Africa, and America.

The fruit is baked or steamed in hollows made in the ground, in which are made fires, then taken out and soaked and baked in the ashes—*E. Palmer*. Fruit eaten after being roasted.—*Thozet and Roth*.

Wood strong, tough, hard and durable, useful for many purposes.—*Bailey's Cat. Ql. Woods*, No. 303.

This is the most valuable of our indigenous trees for planting along the borders of tidal rivers to prevent the washing away of the banks.

## ORDER XCVI. LABIATÆ.

Flowers irregular or rarely nearly regular. Calyx persistent, 5-toothed or 2-lipped. Corolla with a distinct tube and 4 or 5 lobes more or less 2-lipped or nearly equal, imbricate in the bud, the upper lip or lobes usually and perhaps always outside. Stamens 2 or 4, in pairs, inserted in the tube of the corolla and alternating with its lower lobes. Anthers either 2-celled or 1-celled by the confluence of the 2 cells or by the abortion of one of them. Ovary 4-lobed, with 1 erect ovule in each lobe. Style single, arising from the centre of the ovary, terminating in 2 short stigmatic lobes. Fruit enclosed in the calyx, consisting of 4 small seed-like nuts. Seeds solitary in each nut, without albumen. Embryo straight or slightly incurved (except in *Scutellaria*); radicle short, inferior, cotyledons thick.—Herbs or shrubs, very rarely arborescent, the stem and branches usually 4-angled. Leaves always opposite or whorled, without stipules, toothed or more rarely entire or divided. Flowers in opposite cymes or rarely solitary, forming frequently (by the extreme shortness or abortion of the common peduncle and branches of each cyme, the pedicels alone being developed) clusters called *false-whorls* or *verticillasters*, consisting of 3, 5, or more pedicels on each side of the stem; these false whorls either in the axils of the stem-leaves or more

frequently forming terminal racemes or panicles, the floral leaves subtending the clusters being reduced to small bracts. Real bracts, subtending the pedicels, usually abortive or reduced to bristles, rarely more prominent and leaf-like. Foliage and green parts often studded with glandular dots filled with resinous oil, rendering the plants highly aromatic. Nuts when soaked in water frequently emitting a thick mucilaginous coating.

A large Order generally distributed over every part of the globe.

**TRIBE I. Ocimoideæ.**—*Stamens 4, declinate towards the lower lobe of the corolla. Anthers, when fully out, 1-celled by the confluence of the 2 cells into one. Nuts dry, smooth or minutely granular. Calyx with the upper tooth often much broader than the others; corolla with the 4 upper lobes flat, the lowest alone forming the lower lip, and flat, concave or saccate.*

Corolla lower lobe flat or nearly so, not longer than the upper lobes.

Corolla-tube shorter than or scarcely exceeding the calyx. Style with 2 short stigmatic lobes.

Fruiting calyx reflexed with a broad decurrent upper lobe. False-whorls equal, 6-flowered . . . . .

1. OCIMUM.

Fruiting calyx erect spreading or reflexed, the upper lobe scarcely decurrent. Flowers very small in one-sided racemes . . . . .

2. MOSCHOSMA.

Corolla-tube exerted. Style capitate or clavate at the end. Calyx of *Ocimum* . . . . .

3. ORTHOSIPHON.

Corolla lower lobe concave or boat-shaped, longer than the upper lobes (except in *Plectranthus longicornis*).

Filaments free. Corolla sometimes spurred . . . . .

4. PLECTRANTHUS.

Filaments united at the base into a sheath round the style. Corolla never spurred . . . . .

5. COLEUS.

**TRIBE II. Satureiæ.**—*Stamens 4 or 2, erect and equal or ascending in pairs, the upper pair the shortest. Anthers 2-celled or 1-celled by the confluence of the 2 cells into one. Nuts dry, smooth or minutely granular. Corolla-lobes all equally spreading, or if 2-lipped the upper lip scarcely concave and not hood-shaped.*

Corolla-lobes nearly equal.

Anthers terminal 1-celled. Filaments bearded . . . . .

6. DYSOPHYLLA.

Anthers 2-celled. Filaments glabrous.

Perfect stamens 4 . . . . .

7. MENTHA.

Perfect stamens 2 . . . . .

8. LYCOPUS.

**TRIBE III. Monardeæ.**—*Stamens 2; anthers with one oblong or linear perfect cell, the other either quite abortive or deformed or sterile or separated from the upper one by a filiform connective. Nuts dry, smooth or minutely granular. Calyx and corolla usually 2-lipped,*

Connective of the anthers filament-like, transversely fixed on the short real filament . . . . .

9. SALVIA.

Connective of the anthers very small; anthers linear dorsifixed, cells confluent . . . . .

10. \*MONARDA.

**TRIBE IV. Stachydeæ.**—*Stamens 4, ascending in pairs, the lower ones the longest. Anthers, at least the upper ones, 2-celled. Nuts dry, smooth or granular tuberculate. Calyx usually 5 or 10-nerved. Corolla upper lip concave or hood-shaped.*

Calyx 2-lipped, the lips closed after flowering.

Calyx upper lip flat, 3-toothed, lower 2-lobed. False whorls 6-flowered, in dense terminal spikes . . . . .

12. BRUNELLA.

Calyx-lips entire, the upper one with a hollow scale-like protuberance on the back. Flowers opposite in pairs . . . . .

11. SCUTELLARIA.

Calyx 5 or 10 toothed, not 2-lipped.

Stamens included in the corolla-tube. Upper corolla-lip narrow.

Calyx often 10 toothed . . . . .

13. \*MARRUBIUM.

Stamens protruding from the short upper lip . . . . .

14. ANISOMELES.

Stamens ascending under the upper lip.

Calyx 5-toothed, not much enlarged after flowering . . . . .

15. \*STACHYS.

Calyx 5-toothed, very large open and membranous, at least after flowering . . . . .

16. \*MOLUCCELLA.

Calyx 8 or 10 toothed.

Corolla upper lip short very hairy . . . . .

17. LEUCAS.

TRIBE V. **Prostanthereæ**.—Stamens 4, in pairs; anthers all with 2 perfect cells, or 1 cell of all the anthers or also both cells of the lower pair sterile or abortive. Nuts prominently reticulate-rugose. Seeds albuminous. Calyx various. Corolla upper lip erect, usually short, throat broad.

Calyx 2-lipped, the lips entire or nearly so. Anthers with 2 perfect cells, the connective not elongated . . . . . 18. PROSTANTHERA.

Calyx 2-lipped or 5-toothed. Anthers with an elongated connective bearing at the upper end one perfect cell. Connective with the lower end dilated linear or clavate or bearing an imperfect cell, usually bearded in the upper anthers. Leaves obtuse or rarely acute, not pungent. . . . . 19. HEMIGENIA.

Calyx nearly equally 5-toothed. Lower anthers sterile and reduced to 2 linear or clavate lobes. Upper anthers of one cell almost sessile on the filament. Corolla upper lip flat, 2-lobed . . . . . 20. WESTRINGIA.

TRIBE VI. **Ajugoideæ**.—Stamens 4, in pairs exerted from the very short truncate or deeply slit upper lip of the corolla (except very rarely in genera not Australian.) Nuts prominently reticulate-rugose, not succulent, usually attached to near the middle. Seeds without albumen.

Corolla with the four upper lobes lateral, equal or the upper ones longer, the stamens exerted from between the 2 upper ones . . . . . 21. TECRURIUM.

Corolla with the upper lip exceedingly short and truncate, the stamens exerted beyond it, the lateral lobes oblong, forming part of the lower lip 22. AJUGA.

### 1. OCIMUM, Linn.

(From *okimon*, the old Greek name used by Theophrastus.)

Fruiting-calyx enlarged and reflexed, the upper tooth orbicular or ovate with the margins decurrent, forming an upper lip, the 4 lower teeth small, pointed, equal or the two lowest with longer points. Corolla-tube straight, rarely exceeding the calyx, 4 upper lobes united in a broad shortly 4-lobed upper lip, the fifth lower lobe entire, flat or slightly concave, about as long as the upper lip. Stamens 4, declinate, the 2 upper ones usually with a tooth or tuft of hairs near the base; anther-cells confluent. Style-lobes subulate or somewhat flattened. Nuts smooth or minutely-granular.—Herbs undershrubs or rarely small shrubs. Foliage usually densely dotted and highly scented. Flowers in false-whorls of 6, rarely 10, arranged in terminal racemes, the floral leaves reduced to small deciduous bracts.

The genus extends over the tropical and subtropical regions of the New as well as the Old World, two or three species having been very long in cultivation amongst aromatic herbs. The only Australian species is a slight, almost endemic variety of one of the common Asiatic ones.

1. **O. sanctum** (sacred), Linn.; Benth. in DC. *Prod.* xii. 38, var. *angustifolium*; and *Fl. Austr.* v. 74. "Mooda," Cloncurry, "Bullabulla," Mitchell River, Palmer. "Kobilo," Western Queensland, F. O. Foster. A branching perennial or undershrub, usually forming a thick woody base, but sometimes flowering the first year so as to appear annual, rarely exceeding 1ft. in height, more or less hirsute with spreading or reflexed hairs. Leaves on rather long petioles, mostly oblong-lanceolate,  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. long, bordered by a few coarse teeth or nearly entire, more rarely ovate. Flowers small, purple (*F. v. M.*) or pure white (*Bowman*), in loose whorls of 6, forming terminal racemes, the bract-like floral leaves very small. Pedicels slender, often as long as the calyx. Calyx scarcely 1 line long at the time of flowering, when in fruit 2 to  $2\frac{1}{2}$  lines long, the upper lobe orbicular, the lateral ones small and acute, the 2 lowest with long subulate points, Corolla-tube nearly as long as the calyx, the lips as long as the tube, the lower lobe or lip broadly ovate, or nearly orbicular. Stamens shortly exerted, the 2 upper ones with tufts of hairs near the base of the filaments. Style-lobes slightly flattened.—*O. anisodorum* and *O. caryophyllum*, *F. v. M. Fragm.* iv. 46; Rumph. *Herb. Amb.* v. t. 92, f. 2.

Hab.: Charters Towers (narrow-leaved var.), *C. F. Plant*; Croydon, Blackbull Creek, McKinley Ranges, and Buckley River, *R. C. Burton* (all the narrow-leaved variety); Islands Torres Straits, *Bailey* (broad leaved); Burdekin and Suttor Rivers and Peak Downs, *F. v.*

*Mueller*; Bowen, Isaacs and Suttor Rivers, *Bowman*, and many other inland localities.

Widely diffused over tropical Asia, extending into Africa, but usually with broader leaves than in Australia. It is frequently cultivated in East Indian gardens, about temples, &c., for its strong aromatic properties.

Leaves crushed up in water in a cooliman and drunk for fevers and sickness.—*Palmer*.

## 2. MOSCHOSMA, Reichb.

(From its musk-like scent.)

Fruiting-calyx somewhat enlarged, erect spreading or reflexed, the upper tooth broad, with the margins scarcely decurrent, forming an upper lip, the 4 lower teeth small, acute, nearly equal. Corolla-tube straight, rarely exceeding the calyx, the 4 upper lobes united in a broad 3- or 4-lobed upper lip, the fifth lower lobe entire, flat or slightly concave, about as long as the upper lip. Stamens 4, declinate, the filaments without any appendage; anther-cells confluent. Style shortly clavate at the end, entire or emarginate. Nuts smooth or minutely granular.—Herbs, usually annual and much branched. Flowers minute, in false whorls of 6 to 10, all turned to one side and numerous in slender one-sided racemes, the floral leaves reduced to very small deciduous bracts. Foliage said to have a musky smell.

The genus comprises but very few species extending over tropical Asia and Africa. Of the two Australian species, one is common in East India, the other appears to be endemic.

Fruiting calyx reflexed or very spreading, campanulate. Racemes loose 1. *M. polystachyum*. Fruiting-calyx erect or slightly spreading, tubular-campanulate. Racemes

dense . . . . . 2. *M. australe*.

1. ***M. polystachyum*** (spikes numerous), *DC. Prod.* xii. 48; *Benth. Fl. Austr.* v. 75. An erect slender much branched annual of 1 to 2ft., slightly pubescent or nearly glabrous, the stems acutely 4-angled. Leaves on long petioles, ovate or ovate-lanceolate, acuminate, toothed, 1 to 2in. long, the upper ones small. Racemes numerous, terminating the main branches as well as short axillary branchlets, slender and loose. Flowers white or very pale blue, about  $\frac{3}{4}$  line long. Calyx minute when in flower, when in fruit 1 to  $1\frac{1}{2}$  lines long, rather broadly campanulate, very spreading or reflexed, the upper lobe very broad and slightly decurrent. Corolla-tube about as long as the calyx, the lips about as long as the tube.—*Ocimum polystachyon*, Linn. Mant. 567; *Plectranthus parviflorus*, R. Br. Prod. 506, not of Willd.

Hab.: Broadsound. *R. Brown*; Wide Bay, *Bidwill*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Amity and Nercool Creek, *Bowman*; Rockhampton, *O'Shanesy*; Balonne River, *Mitchell*; Barron River, *E. Cowley*; Flinders River, *C. F. Plant*; Mt. Perry, *J. Keys*.

The species is a common weed in tropical Asia, extending into Africa.

2. ***M. australe*** (Australian), *Benth. Fl. Austr.* v. 76; *DC. Prod.* xii. 48. An erect herb of 2 or 3ft., closely allied to *M. polystachyum*, but coarser, the foliage and calyxes usually more pubescent and the racemes more dense and spike-like. Fruiting-calyx more erect, longer and not so broad in proportion as in *M. polystachyum*, the upper lobe not so broad, and the lower ones broader than in that species; the corolla-tube more slender, slightly exceeding the calyx, the lips shorter than the tube. Middle lobe of the upper lip emarginate in *M. australe* (lip 4-lobed), entire in *M. polystachyum* (lip 3-lobed), according to *R. Brown*.—*Plectranthus moschatus*, R. Br. Prod. 506.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

## 3. ORTHOSIPHON, Benth.

(Referring to the straight tube of the corolla.)

Fruiting-calyx enlarged and reflexed, the upper tooth orbicular or ovate with the margins decurrent, forming an upper lip, the 4 lower teeth small and pointed. Corolla-tube straight or somewhat curved, longer than the calyx, 4 upper lobes

united in a broad 3- or 4-lobed upper lip, lower lobe entire, flat or slightly concave, as long as or (in a species not Australian) longer than the upper lip. Stamens 4, declinate, without appendages; anther-cells confluent. Style clavate or capitate at the end, entire or slightly notched. Nuts small, granular-punctate. —Perennial herbs. Flowers in false-whorls of 6 or rarely fewer, in long interrupted or short and dense racemes, the floral leaves reduced to bracts.

The genus is chiefly Asiatic. The only Australian species is a widely spread Asiatic one. The genus has the calyx and habit of *Ocimum*, from which it differs in the elongated corolla-tube and capitate stigma.—*Benth.*

1. **O. stamineus** (stamens prominent), *DC. Prod.* xii. 52; *Benth. Fl. Austr.* v. 76. Cat's Mustache. A loosely branched perennial of 1 to 3 ft., slightly hoary-pubescent or nearly glabrous. Leaves petiolate, ovate or ovate-lanceolate, often acuminate, 1 to 2 in. long, irregularly and coarsely toothed, or rarely regularly crenate or almost entire. Flowers white or pale blue, in whorls of 4 to 6, in loose but rather short terminal racemes, and by their long stamens resembling those of a *Clerodendron*. Pedicels about as long as the flowering calyx, which scarcely exceeds  $1\frac{1}{2}$  line. Corolla-tube slender 4 to 5 lines long or even more, the lips very spreading, shorter than the tube. Stamens filiform, two or three times as long as the corolla-tube, with very small anthers. Style still longer, the stigmatic end small and clavate. Fruiting-calyx attaining  $\frac{1}{2}$  in., the upper lobe ovate, obtuse and decurrent, the lateral ones nearly as long, acute, with short points, the lower ones connate to the middle, and produced into long incurved subulate points.

Hab.: Cape York, *McGillivray*, *Veitch*; Port Denison and Daintree River, *Fitzalan*; Burdekin River, *Bowman*; Rockingham Bay, *Dallachy*; not uncommon in tropical localities. Frequent in the Indian Archipelago, extending on the Asiatic continent to Assam and Silhet.

#### 4. PLECTRANTHUS, Duer.

(Referring to the corolla being spurred).

Fruiting-calyx in the Australian species reflexed, the upper tooth broad and sometimes decurrent, the 2 lowest long and pointed, the lateral ones shorter, in some other species the teeth all nearly equal. Corolla-tube longer than the calyx, gibbous or produced into a spur on the upper side; upper lip 3- or 4-lobed, lower lip entire, concave, longer than, or rarely rather shorter than the upper one. Stamens declinate, free, without any appendage; anther-cells confluent. Style shortly bifid. Nuts smooth or slightly granular. —Herbs, undershrubs, or in species not Australian, shrubs. Flowers usually numerous, rarely only 6, in false-whorls, often developed into loose opposite cymes forming terminal panicles, in the Australian species more compact, forming interrupted racemes, the floral leaves reduced to small deciduous bracts.

The genus is widely spread over tropical and subtropical Asia and Africa. Flowers in false-whorls of 6, lower calyx lobes obtuse. Corolla with a long spur.

Flowers in false-whorls of 10 or more. Lower calyx-lobes very obtuse or aristate. Corolla not spurred.

1. *P. longicornis*.

2. *P. parriflorus*.

3. *P. congestus*.

4. *P. fortidus*.

False-whorls loose, of about 10 flowers. Fruiting-calyx 2 to 3 lines long . . . . . 2. *P. parriflorus*.  
False-whorls dense, of about 20 flowers. Fruiting-calyx about 1 line long . . . . . 3. *P. congestus*.  
Flower-whorls dense. Calyx 2 to 3 lines long . . . . . 4. *P. fortidus*.

1. **P. longicornis** (long-spurred), *F. v. M. Fragm.* v. 51; *Benth. Fl. Austr.* v. 77. A perennial, more or less pubescent or villous, with short rather rigid hairs. Leaves usually 2 or 3 pairs near the base of the stem, obovate or oblong, obtuse, sinuate or coarsely toothed, especially near the base;  $1\frac{1}{2}$  to 3 in. long, contracted into a short petiole; below the lowest pair there are also usually 2 or 3 pairs of very small nearly sessile orbicular leaves. Flowering stems erect, often above 1 ft. high, simple or slightly branched, leafless except at the base,

the floral leaves being all reduced to ovate reflexed bracts; rarely the stock emits also long weak decumbent stems with a few distant pairs of narrow leaves. Flowers deep purple (*Dallachy*) or blue (*P. r. M.*), in false whorls of 6, forming long slender racemes. Pedicels 1 to 2 lines long. Calyx at first very small and open, when in fruit about 2 lines long, very much incurved, deeply 2-lipped, the upper lip formed of the broad obtuse slightly decurrent and recurved upper tooth with the 2 very small lateral lobes at its base, the lower lip as long as the upper, obtuse and emarginate, incurved and concave. Corolla-tube slender, nearly 2 lines long, produced at the base into a long narrow conical spur; upper lip erect, broad, shortly 4-lobed, shorter than the tube; lower lip oblong-obovate, very concave, rather shorter than the upper. Stamens shorter than the corolla, the two upper ones inserted much lower down than the lower ones.

Hab.: Cape York, *McGilliray*; Rockingham Bay, *Dallachy*; and many other tropical localities.

2. ***P. parviflorus*** (flowers small), *Willd.*; *Benth. in DC. Prod.* xii. 67, *not of R. Br.*; and *Fl. Austr.* v. 78. An erect herb or undershrub very variable in size and indumentum, sometimes under 1ft. and much branched at the base, sometimes attaining 2 or 3ft.; the stems rather fleshy, the whole plant pubescent villous or tomentose or rarely nearly glabrous. Leaves in the lower part of the stem petiolate, ovate to orbicular, coarsely crenate, rounded or cordate at the base, from under 1in. to 2 or even 3in. diameter, usually rather thick soft rugose and tomentose or villous, but sometimes nearly glabrous and smooth. Flowers small, of a bluish-purple, in false whorls of about 10, forming long terminal leafless racemes either simple or slightly branched, the floral leaves reduced to minute bracts falling off from the very early buds. Pedicels usually longer than the very small flowering calyx; the fruiting calyx reflexed, much curved, striate, 2 to nearly 3 lines long, the upper tooth or lobe broad obtuse and slightly decurrent, the 4 lower ones incurved, very acute or subulate-acuminate, the 2 lateral ones as long as, the 2 lowest longer than, the upper one. Corolla-tube about twice as long as the calyx, declinate and slightly gibbous at the base but not spurred; upper lip short and erect, the 2 upper lobes rather larger than the lateral ones, the lower lip twice as long; very concave. Stamens nearly as long as the lower lip.—*P. graveolens*, *R. Br. Prod.* 506; *P. australis*, *R. Br. Prod.* 506, *Bot. Reg.* t. 1098, *Benth. in DC. Prod.* xii. 67.

Hab.: Gilbert River, *F. v. Mueller*; Kennedy district, *Daintree*; Broadsound, Shoalwater Bay, Northumberland Island, *R. Brown*; Burdekin River, *Fitzalan*; Lizard Island, *McGilliray*; Whitsunday Island, *Henne*; Rockhampton, *Dallachy*, *Bowman*; Brisbane River, Moreton Bay, *F. v. Mueller*; top of Mount Faraday, *Mitchell*.

There are certainly two forms of this species in Queensland, distinguished by the size of plant and foliage.

The species extends to New Caledonia and other islands of the South Pacific and to the Sandwich Islands.

3. ***P. congestus*** (crowded), *R. Br. Prod.* 506; *Benth. Fl. Austr.* v. 78. "Kar-Kar," Mitchell River, *Palmer*. A tall herb, attaining according to *Dallachy* 10 to 12ft., usually hoary-tomentose. Leaves ovate, shortly acuminate or obtuse, coarsely crenate, narrowed into a petiole, soft and rugose, tomentose on both sides, about 2 or 3in. long, the lower ones longer. Flowers small, blue, numerous (often above 20), in dense false whorls, forming long almost spike-like interrupted racemes of which several are collected in a large terminal leafless panicle, the floral leaves reduced to minute very deciduous bracts. Pedicels very short. Calyx villous and copiously dotted and scarcely above 1 line long when in fruit, declinate or reflexed, the upper lobe broadly ovate, obtuse, not decurrent, the lateral ones acute but not much narrower, the two lowest narrower and rather longer, incurved and very acute. Corolla-tube about 2 lines long, abruptly declinate and slightly gibbous on the

upper side below the middle but not spurred; upper lip about half as long as the tube, the 2 upper lobes broadly obovate, the 2 lateral ones very much smaller; the lower lobe or lip twice as long as the upper one and very concave.—Benth. in DC. Prod. xii. 66.

Hab.: Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*; and many other tropical localities.

Leaves and branches crushed in water and drunk for internal complaints.—*Palmer*.

4. **P. fœtidus** (of a disagreeable odour), *Benth. Lab. 35*; *DC. Prod. xii. 65*; *F. v. M. Fragm. ix. 161* and *xi. 135*. Plant of several feet high. Leaves 3 to 6 or more inches long, 2 to 3 or sometimes more broad, cordate crenate-dentate; rugose woolly-tomentose. Flowers dense, the spikes opposite, scarcely pedunculate. Calyx 2 to 3 lines long, the lobes as long as the tube. Corolla blue, the upper lip obcordate, bearded, lower lip cymbiform. Stamens free, glabrous; anthers bluish, ovate-rotund. Style the length of the stamens, glabrous. Stigmatic lobes 2, very short. Nuts lenticular, curved, bright, minute.

Hab.: Endeavour River, *Banks and Solander*; Daintree River, *E. Fitzalan*.—(*F. v. M.*)

### 5. COLEUS, Lour.

(Referring to the stamens forming a sheath round the style.)

Fruiting-calyx usually declinate or reflexed, the upper tooth broad, scarcely decurrent, the lateral ones truncate or acute, the two lower usually longer, more connate and acute. Corolla-tube longer than the calyx, declinate or bent down, not spurred; upper lip short, 3- or 4-lobed, the lower much longer, entire, very concave or boat-shaped. Stamens 4, more or less connate in a tube round the style; anther-cells confluent. Style shortly bifid at the top. Nut small, smooth.—Herbs rarely shrubs. Flowers in false-whorls of 6 or more, sometimes very dense, sometimes growing out into opposite variously branched cymes, forming terminal leafless racemes or panicles, the floral leaves reduced to small deciduous bracts.

The genus extends over tropical Asia and Africa, the only Australian species being apparently the same as a common one in the Archipelago, although represented by endemic forms or varieties, which however require further investigation. The genus differs from *Plectranthus* chiefly in the monadelphous stamens.—*Benth.*

1. **C. scutellarioides** (Scutellaria-like), *Benth.: D.C. Prod. xii. 73*; *Fl. Austr. v. 79*. A tall herb or undershrub, the typical form pubescent or nearly glabrous, with slender branches. Leaves petiolate, ovate, acuminate or obtuse, slightly crenate-toothed and more or less purple underneath in the typical form, but varying much in the Australian varieties, mostly  $1\frac{1}{2}$  to 3 in. long. Flowers rather small and numerous at first, in rather compact false-whorls forming long slender terminal racemes, but in most varieties as the flowering advances the two primary branches on each side lengthen considerably, converting the false-whorl into two opposite sessile once forked cymes, with the pedicel arranged along each branch. Calyx very small when in flower, enlarged afterwards, deflexed, the tube striate, the broad upper lobe slightly decurrent, the lateral ones rather shorter and very obtuse, the 2 lowest much longer, connate to near the end where they form two small points. Corolla-tube slender, slightly gibbous at the base, then abruptly bent down, the throat dilated especially in the Australian varieties, of a pale bluish white as well as the upper lip, the lower boat-shaped lip or lobe of a deeper blue. Stamens not exceeding the lower lobe.—*Ocimum scutellarioides*, Linn.; *Bot. Mag. t. 1446*; *Plectranthus scutellarioides*, R. Br. Prod. 506.

Hab.: Harvey's Creek, Russell River, *Bailey*; Batavia River, *H. Milman*; Charters Towers, *C. F. Plant*.

Distributed over the Indian Archipelago.

The flowers are in the typical form rather smaller, and the fruiting cymes usually less developed than in Australia.—*Benth.*

## 6. DYSOPHYLLA, Blume.

(Leaves fetid.)

Calyx equally 5-toothed. Corolla with a short tube; the limb of 4 equal or nearly equal lobes. Stamens 4, nearly equal, exserted, the filaments bearded; the anthers small, terminal, nearly globular, 1-celled.—Herbs. Leaves opposite or whorled. Flowers in dense false-whorls, forming close cylindrical spikes.

The genus comprises several tropical Asiatic species, including among them the only Australian one.

1. **D. verticillata** (leaves in whorls), *Benth.*; *D.C. Prod.* xii. 157; *Fl. Austr.* v. 81. A glabrous or somewhat pubescent herb, decumbent at the base or floating in water, ascending to 1ft. or more. Leaves in whorls of 4 to 6 or rarely more, sessile, linear or linear-lanceolate, entire, with recurved margins, 1 to 2in. long or even more. Flowers very small and numerous, the false-whorls crowded in dense cylindrical spikes of  $\frac{3}{4}$  to 2in., the tips of the bracts subtending the false-whorls sometimes appearing in the young spikes in 4, 6 or 8 rows. Calyx softly villous, scarcely one line long when in fruit, and much smaller in the flower. Corolla-tube shorter than the calyx, the lobes as long as the tube. Stamens shortly exceeding the corolla-lobes, the filaments bearded with reddish purple hairs.

Hab.: Mitchell River, Gulf of Carpentaria, *Leichhardt*, the common form with glabrous stems and foliage; Edges of waterholes, Rockingham Bay, *Dallachy*, a pubescent variety also found in India, but not so common as the glabrous one; Gilbert River, *F. v. M.*

The species is widely spread over East India and the Archipelago. Thwaites is probably right in uniting with it as varieties *D. crassicaulis*, *Beuth.*, and *D. tetraphylla*, *Wight, Ic. t. 1444.—Benth.*

## 7. MENTHA, Linn.

(The Greek name for Mint.)

Calyx regular or slightly 2-lipped, 5-toothed. Corolla-tube not at all or scarcely exceeding the calyx; limb 4-lobed, the lobes all equal and spreading or the upper one broader and notched. Stamens, 4, equal, erect, distant; filaments glabrous; anthers with 2 parallel cells. Style shortly bifid. Nuts smooth.—Herbs, usually copiously dotted and strongly scented. Flowers small, in false-whorls usually dense rarely few flowered, all axillary or in species not Australian, forming terminal spikes, with the floral leaves reduced to bracts. Bracts within the false-whorls minute, or rarely subulate and as long as the calyx.

The genus is chiefly extratropical and most abundant in Europe and Northern Asia, with one or two North American species scarcely different from Asiatic ones, so also the very few tropical Asiatic forms are but slight modifications of common northern ones. The Australian species are all endemic. They appear as difficult to define by positive characters, and to pass into each other as gradually as the species allied to *M. arvensis* in the northern hemisphere. They all belong to the group with axillary false-whorls.—*Benth.*

Leaves mostly toothed. Flowers less numerous, the corolla fully 5 lines long. Pedicels short. . . . . 1. *M. grandiflora*.  
 Leaves all or mostly entire. Pedicels very short (except where the flowers are very few).  
 Flowers numerous, rather large. Calyx-teeth subulate. Corolla under 4 lines long. Leaves lanceolate. . . . . 2. *M. australis*.  
 Flowers few in the false-whorls and small. Calyx-teeth short, densely hairy inside. Leaves ovate to oblong-linear. . . . . 3. *M. saturioides*.

1. **M. grandiflora** (flowers large), *Benth.* in *Mitch. Trop. Austr.* 362 and in *D.C. Prod.* xii. 698 and *Fl. Austr.* v. 82. Softly pubescent. Leaves petiolate, ovate, mostly toothed,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. long. False-whorls all axillary, loose and not many-flowered, but the pedicels all shorter than the calyx. Calyx about



2½ lines long, the teeth lanceolate or lanceolate-subulate, scarcely villous inside. Corolla fully five lines long, the tube rather longer than the calyx, the upper lobe deeply notched or shortly bifid. Stamens and style much longer than the corolla.

Hab.: On the Maranoa, *Mitchell*.

The specimens are but few, and may hereafter prove to be exceptional, but the flowers are much larger than those of any *Mentha* known to me, and the foliage is nearer that of *M. laxiflora* than of *M. australis*.—*Benth.*

**2. *M. australis*** (Australian), *R. Br. Prod.* 505; *Benth. Fl. Austr.* v. 83. Stems erect or ascending, branched, 1 to 2 or more feet high, usually scabrous on the angles. Leaves lanceolate or rarely ovate-lanceolate, quite entire or here and there sparingly toothed, contracted into a short petiole or almost sessile, glabrous or hoary-pubescent, especially underneath, often above 1 in. long. Flowers in axillary false-whorls, usually numerous, on very short pedicels or quite sessile. Calyx narrow, hoary-pubescent or villous, 2 to nearly 3 lines long, the teeth subulate or narrow-lanceolate, very acute, slightly villous inside. Corolla-tube not exceeding the calyx, the lobes shorter than the tube, the upper one more or less deeply 2-lobed, the whole corolla under 4 lines long.—*Benth.* in *D.C. Prod.* xii. 174; *Hook. f. Fl. Tasn.* i. 231; *Micromeria australis*, *Benth. Lab. Gen. et Sp.* 380.

Hab.: In the interior, *Mitchell*; Darling Downs to the Georgina.

The difference observed in the upper lobe of the corolla of this and the allied species, deeply lobed, notched only, or entire, require further observation to ascertain whether they are really of specific constancy.—*Benth.*

**3. *M. satureioides*** (Satureia-like), *R. Br. Prod.* 505.; *Benth. Fl. Austr.* v. 84. A small much branched erect or diffuse perennial under 1 ft. and often only a few inches high, glabrous or minutely hoary-pubescent. Leaves petiolate or sometimes almost sessile, usually oblong or oblong-lanceolate, but varying from ovate to almost linear, obtuse, entire, under ½ in. long when broad, sometimes nearly 1 in. when narrow. Flowers usually 6 or fewer, rarely rather more, in axillary false-whorls. Pedicels shorter than the calyx and often very short. Calyx 1½ to nearly 2 lines long, the teeth shortly lanceolate or triangular, always densely villous inside with white hairs, readily distinguishing this species from all others. Corolla small, the upper lobe usually shortly bifid.—*Benth.* in *D.C. Prod.* xii. 147; *Micromeria satureioides*, *Benth., Lab. Gen. et Sp.* 380; *Bartl. in Pl. Preiss.* i. 354.

Hab.: Burnett River and Moreton Bay, *F. v. Mueller*; Rockhampton, *Thozet*; Darling Downs, *Lau.* A very common species.

Yield of oil from 1 cwt. of nearly fresh plants 14 ozs., *J. F. Bailey*.

## 8. LYCOPUS, Linn.

(From *lukos*, a wolf, and *pous*, a foot; leaves of some species resemble foot of a wolf.)

Calyx equally 4- or 5-toothed. Corolla-tube short, limb nearly equally 4-lobed. Two upper stamens reduced to small filiform staminodia sometimes capitate at the top; the two lower ones perfect, distant, with 2-celled anthers. Style shortly bifid. Nuts smooth, with three callous angles and truncate at the top.—Perennial herbs, usually emitting stolones. Flowers small, usually numerous, in dense axillary false-whorls. Bracts within the false-whorls minute, or the outer ones as long as the calyx.

The genus consists of very few species, or varieties, dispersed over the temperate regions of the northern hemisphere, the only Australian species scarcely differing from some of the northern forms.—*Benth.*

**1. *L. australis*** (Australian), *R. Br. Prod.* 500; *Benth. Fl. Austr.* v. 85. An erect herb, attaining sometimes 2 or 3 ft., glabrous or sprinkled with a few minute hairs. Leaves lanceolate, acuminate, bordered by a few rather coarse acute

teeth, contracted into a short petiole or nearly sessile, often 3 or 4 in. long, usually scabrous with very short rigid hairs or small tubercles. Flowers in dense axillary false-whorls, intermixed with subulate or linear-lanceolate bracts, of which the outer one often exceeds the calyx. Calyx  $1\frac{1}{2}$  line long or rather more, with 5 acute lanceolate teeth longer than the tube. Corolla scarcely exceeding the calyx, the lobes shorter than the tube. Staminodia small, usually clavate at the end, but apparently variable; perfect stamens longer or shorter than corolla.—Benth. in D.C. Prod. xii. 178; Hook, f. Fl. Tasm. i. 282.

Hab.: Darling Downs and Stanthorpe, Burnett River and Stradbroke Island.

## 9. SALVIA, Linn.

(Alluding to the healing qualities of the Sage.)

Calyx 2-lipped, the upper lip entire or with 3 minute teeth, the lower lip 2-cleft. Corolla with the upper lip erect, concave or arched, entire or scarcely notched, the lower lip spreading, 3-lobed, the middle lobe often notched or divided. Stamens 2, but easily mistaken for 4, the real filaments very short, the filiform connective appearing like branches of the filament, with a single oblong linear anther-cell at the upper end, and at the lower end a small empty cell, usually much deformed or quite rudimentary, rarely almost perfect.—Herbs, shrubs or trees, extremely diversified in habits and inflorescence.

A very large genus, widely distributed over the temperate and warmer regions of the globe, although within the tropics the majority of species are mountain plants.

1. **S. plebeia** (of mean appearance), *R. Br. Prod.* 501; *Benth, Fl. Austr.* v. 85. An erect branching pubescent or hairy coarse annual, 1 to 2 or even 3 ft. high, the inflorescence sometimes glandular-viscid. Leaves petiolate, oblong or lanceolate, obtuse or acute, rugose,  $1\frac{1}{2}$  to 3 in. long. Flowers exceedingly small, in false-whorls of 6, forming branched paniculate racemes. Calyx pubescent, ovoid and 1 line when in flower, reflexed and campanulate and 2 lines long when in fruit, the upper lip entire, recurved, obtuse or obscurely pointed. Corolla scarcely longer than the calyx, the upper lip short, erect and concave. Connectives of the anthers free at the lower end with a small barren anther cell.—Benth. in D.C. Prod. xii. 355.

Hab.: Burdekin River, *F. v. Mueller*; Rockhampton, *Thozet*, *O'Shanesy*; Kennedy District, *Daintree*; Darling Downs, *Lau*; and many other localities.

The species is common in E. India, extending from Cabul to the Philippines and northward to Pekin and Japan.

2. **S. coccinea** (scarlet), *Linn.*: *Benth.* l.c. 343, and in *Fl. Austr.* v. 86. Erect branching and almost shrubby, hoary-pubescent. Leaves rather small. Corolla scarlet, the upper lip short and erect, the lower large and broad.

Hab.: North America. Naturalized about towns.

## 10. \*MONARDA, Linn.

(After Nic. Monarda, or Monardes, a physician of Seville.)

Calyx tubular, elongated, 15-nerved, nearly equal 5-toothed; throat villous inside, rarely almost naked. Corolla with an exserted or inclosed tube, glabrous or pubescent inside, exannulate; throat dilated a little; limb 2-lipped, linear or oblong, nearly equal; upper lip erect, entire or emarginate; lower lip spreading, shortly trifid at the apex, the lateral lobes ovate, obtuse; the middle one narrower, oblong, retuse or emarginate. Stamens 2 (inferior), ascending, usually exserted from the upper lip of the corolla; the rudiments of the two superior ones almost wanting; filaments toothless, inserted at the throat of the corolla; anthers linear, somewhat 2-celled; cells divaricate, confluent, with connate margins.

Style almost equally bifid at top; stigmas minute, terminal. Nuts dry, smooth. Herbs, with entire usually toothed or crenated leaves. Flowers collected into dense whorls, supported by bracts, which are often coloured.

**M. aristata** (awned), *Benth. Lab.* 318. An erect branching herb slightly hoary, and all parts hairy. Leaves lanceolate, tapering much towards the base, 2 or 3 in. long, serrate. Flowers in dense whorls, white; bracts ciliate, sessile, usually of a purple colour, ending in long awns. Calyx-tube striate, much bearded at the throat; lobes long, subulate. Corolla white, spotted with purple; tube about as long as the calyx-lobes. Stamens shorter than the upper lip.

Hab.: Harrisville, from whence it was received from *Rev. J. Coles*, as a plant becoming naturalized in that locality. It is a native of Arkansas, Texas, and other parts of America, from whence it has been introduced in garden seeds.

## 11. SCUTELLARIA, Linn.

(*Scutellum*, a shield, in allusion to shape of calyx-lip.)

Calyx divided into 2 entire lips, the upper one bearing on its back a hollow scale-like protuberance. Corolla with a rather long tube, and small nearly closed lips, the upper one concave, emarginate, the lower lip convex, spreading, emarginate at the end, the lateral lobes more frequently connate with the upper lip than with the lower. Stamens 4, in pairs, ascending under the upper lip; anthers ciliate, those of the upper pair 2-celled, those of the lower 1-celled by the abortion of the second cell. Style with the upper stigmatic lobe exceedingly short. Nuts granular-tuberculate, raised on a short oblique stalk.—Herbs or rarely shrubs. Flowers solitary within each floral leaf, either opposite and axillary or in terminal racemes or spikes.

The genus is widely distributed over the temperate and some of the warmer regions both of the New and the Old World.

1. **S. humilis** (low), *R. Br. Prod.* 507; *Benth. Fl. Austr.* v. 88. A perennial with a slender creeping rootstock and ascending stems, nearly glabrous or only minutely pubescent. Stems usually under 6 in. and rarely when very luxuriant nearly a foot long. Lower leaves petiolate, broadly ovate or almost orbicular, usually cordate, marked with a few deep crenatures or almost lobed, rarely above  $\frac{1}{2}$  in. long, the lower floral ones often the largest on long petioles and almost deltoid, the upper ones gradually smaller, narrower and with shorter petioles, but none quite sessile. Pedicels axillary, both turned to one side, 1 to 3 lines long. Calyx minutely pubescent. Corolla about 3 lines long, the lower lip rather longer than the upper one.—*Benth. in DC. Prod.* xii. 427; *Hook. f. Fl. Tasm.* i. 283.

Hab.: Various localities from the Islands of Moreton Bay to Stanthorpe.

The species is nearly allied to the European and Asiatic *S. minor* and to the N. America *S. parvula*.—*Benth.*

## 12. BRUNELLA, Linn.

(From the German name of a complaint it was supposed to cure).

Calyx 2-lipped, the upper lip flat, truncate, shortly 3-toothed, the lower with 2 lanceolate lobes. Corolla-tube as long as or longer than the calyx, the upper lip erect, short, broad, concave, nearly entire, the lower one spreading, 3-lobed. Stamens 4, in pairs, ascending under the upper lip, each filament with a small tooth under the anthers. Anther-cells distinct, divaricate. Style bifid at the top. Nuts oblong, smooth.—Perennial herbs, usually decumbent at the base. Flowers in false-whorls of 6, forming dense terminal spikes, with bract-like floral leaves.

A genus of very few species, very widely dispersed over the temperate regions and tropical mountains of both the New and the Old World. The only Australian species is the common one over the whole range of the genus.

1. **B. vulgaris** (common), *Linn.*; *Benth. in DC. Prod.* xii. 410; and *Fl. Austr.* v. 87. Stems procumbent or shortly creeping at the base, the flowering branches ascending sometimes to above 1ft., more or less sprinkled as well as the foliage with short rigid hairs, rarely glabrous. Leaves petiolate, lanceolate or ovate-lanceolate, acute or obtuse, entire or somewhat toothed, 1 to 3in. long. Flowers purplish-blue or rarely white, in false whorls of 6, forming a dense terminal spike, the bract-like floral leaves broad, shortly pointed, often coloured, about as long as the calyx. Fruiting-calyx usually about 4 lines long, the upper lip broad and flat, the lobes of the lower lip linear-lanceolate, acute, as long as the upper lip. Corolla varying from a little longer than the calyx to twice as long.—*R. Br. Prod.* 507; *Hook. f. Fl. Tasm.* i. 282; *Wight. Ic.* t. 1448.

Hab.: Logan River, *Rev. B. Scortechini*; Gladfield, *C. J. Gwyther*.

The species is common in Europe, northern Asia and North America, extending within the tropics into the mountainous regions of Asia and South America.

### 13. \*MARRUBIUM, *Linn.*

(From the Hebrew name.)

Calyx tubular, 5- to 10-nerved, teeth 5 to 10, equal, short, subspinescent. Corolla short, tube naked or annulate within, upper lip erect, lower spreading, middle lobe largest. Stamens 4, included; anthers glandular, cells diverging. Style lobes short, obtuse. Nuts obtuse.—Perennial tomentose or woolly herbs. Whorls axillary. Flowers small.

Natives of the temperate and warm regions of the Old World.

1. **M. vulgare** (common), *Linn.*; *Benth. in DC. Prod.* xii. 152. The common White Horehound. A robust leafy herb of 2 to 3ft., clothed with woolly white hairs. Leaves petiolate, ovate or orbicular,  $\frac{1}{2}$  to 1½in. diameter, crenate and rugose. Whorls axillary, villous. Calyx 2 to 3 lines, coriaceous, teeth often hooked at the tip. Corolla  $\frac{1}{2}$ in., white, tube slender, upper lip long, 2-fid. Nuts 1 line, smooth.

Hab.: Naturalized and plentiful in many localities.

Met with in Europe, Asia, and North Africa.

### 14. ANISOMELES, *R. Br.*

(From the Greek, unequal members.)

Calyx 5-nerved, 5-toothed. Corolla-tube about as long as the calyx, the upper lip erect, entire, short and somewhat concave; lower lip longer, spreading, 3-lobed, the middle lobe larger than the others, emarginate or 2-lobed. Stamens 4, in pairs, projecting from the upper lip of the corolla; anthers of the upper pair 1-celled, of the lower pair 2-celled, all the cells parallel and transverse. Nuts smooth.—Coarse herbs. Flowers in false-whorls either dense or developed into opposite cymes, all axillary or forming terminal racemes.

The genus consists of very few but very variable species, common in tropical Asia, scarcely extending into E. Africa. The Australian forms, whether regarded as one or as four or five species, are supposed to be endemic, but they approach very near to a few of the narrower-leaved E. Indian varieties of *A. orata* and *A. Heyneana*.—*Benth.*

1. **A. salvifolia** (*Salvia*-leaved), *R. Br. Prod.* 503; *Benth. Fl. Austr.* v. 89. A coarse erect herb, attaining 2 to 3ft. or even more, very variable in indumentum and in the development of the inflorescence, frequently hoary-tomentose or almost woolly without spreading hairs, or when the plant is greener often hispid with spreading hairs especially on the angles of the stem, the calyxes and inflorescence more or less glandular-viscid in the hispid forms, the glands less conspicuous or entirely concealed in the tomentose ones. Leaves lanceolate or ovate-lanceolate, or rarely almost ovate in the small flowered forms, coarsely toothed, the large

ones 2 to 4 in. long contracted into a petiole, the floral ones passing into small bracts, all from thick soft and densely woolly tomentose on both sides to green and pubescent only or almost glabrous. Flowers variously described as pink, blue or pale purple, in loose false-whorls generally turned to one side, the lower ones sometimes axillary, the upper ones forming interrupted or densely irregular terminal racemes or thyrsoïd panicles. As the flowering advances the primary branches of each cyme often lengthen out to above  $\frac{1}{2}$  in., with the flowers all erect on the upper side. Pedicels very short, each in the axil of a small linear bract. Calyx usually about 2 lines when the flower first opens, but lengthening to 3, 4 or even 5 lines, the tube 5-angled, the teeth lanceolate or more or less subulate, shorter than the tube. Corolla-tube scarcely so long as the calyx and the upper lip still shorter; lower lip at least twice as long as the upper. Nuts shining. —Benth. in D.C. Prod. xii. 455.

Hab.: From Cape York to Moreton Bay, but not found far inland.

Benth l c. says:—The very different aspects given to the specimens by the diversities in the indumentum must at first suggest the existence of several species, and, had we only Brown's specimens, we should without hesitation have adopted the three he has proposed; but with the very large number from various localities now before me, I am unable to assign any positive limits to any of the following:—

1. Covered with a very dense soft white or hoary tomentum, sometimes thick and almost woolly, sometimes close and cottony—the typical *A. salvifolia*, Br.—Islands of the Gulf of Carpentaria, *R. Brown*; Kennedy District, *Daintree*; Nerkoool Creek, *Bowman*; Rockingham Bay, *Dallachy*.

2. More loosely tomentose, the hairs scarcely spreading, the tomentum less white, passing through some specimens into the next form.—Sweers Island, *Henne*; and the commonest form throughout Queensland, not far from the coast, and in the adjoining islands, *A. Cunningham*, *Fraser*, *McGillivray*, *Bidwill*, *F. v. Mueller*, *Henne*, *Dallachy*, *Bowman*, and many others.

3. Greener, pubescent, or nearly glabrous, scarcely tomentose, but without spreading hairs, the inflorescence usually looser and the flowers smaller than in the densely tomentose form.—Rockingham Bay, *Dallachy*; Trinity Island, *McGillivray*. To this form I should refer *A. moschata* and *A. inodora*, *R. Br. Prod.* 503, Benth. in D.C. Prod. xii. 455, the former from Keppel and Shoalwater Bays, leading towards the common Queensland form (n. 2), the latter from Prince of Wales Island, more nearly glabrous than any other, all very near to the *E. Indian A. Heyneana*.

4. Scarcely tomentose, green, more or less hirsute with spreading hairs.—Rockingham Bay, *Dallachy*; Gilbert River, *F. v. Mueller*; the latter specimens more hispid still than *Dallachy*'s.

## 15. \*STACHYS, Linn.

(Flowers in a spike.)

Calyx 5- to 10-nerved, teeth 5, subequal. Corolla with usually a ring of hairs within the throat, not dilated, upper lip erect, lower spreading, 3-lobed, middle lobe the longest. Stamens 4, ascending; anthers connivent; cells parallel or diverging, style-lobes subequal. Nuts obtuse. Herbs or undershrubs. Leaves crenate or serrate; whorls axillary and in terminal spikes or racemes.

The species are found in all temperate and some in warm climates.

1. **S. arvensis** (cultivation-field plant); *Linn. Benth in D.C. Prod.* xii. 477; *Fl. Austr.* v. 73. European Hedge-nettle or Queensland Stagger Weed. A decumbent or ascending, slender, hairy annual, from a few inches to over 1 ft. high. Leaves ovate, petiolate. Flowers small, pale purple, in false-whorls of 2 to 6 or 8, forming loose leafy spikes. Calyx with 5 nearly equal teeth as long as the tube. Corolla scarcely longer than the calyx, the upper lip erect, concave and entire, the lower lip spreading, 3-lobed. Stamens 4, in pairs, ascending under the upper lip. Anthers 2-celled.

Hab.: A common weed of cultivation in most parts. Introduced from Europe.

There is a pretty general belief in Queensland that this weed is dangerous to working horses and bullocks that may browse upon it. Cattle if only browsing and let alone are said

not to be affected by it. The effects on the working animal are "all at once to stop, shiver all over, and if not allowed to spell for a considerable time it is almost sure to die.—*Bailey and Gordou's Plants Reputed Poisonous and Injurious to Stock*.

### 16. \**MOLUCCELLA*, Linn.

(A diminutive, from Molucca Islands, of which one of the species was supposed to be a native.)

Calyx obliquely campanulate at the base, striate; limb ample, dilated, reticulately veined, with 5 to 10 mucrones or spines. Corolla with an inclosed tube, which is obliquely annulate inside; limb bilabiate; upper lip erect, entire or emarginately bifid; lateral lobes of lower lip erectish, middle lobe spreading, broad, obcordate. Stamens 4, didynamous, ascending, lower ones the longest; filaments naked at the base. Anthers laterally pedicellate at the tops of the filaments, 2 celled; cells almost distinct, divaricate. Style about equally bifid at apex, stigmas nearly terminal. Nuts acutely triquetrous, truncate at apex. Annual glabrous herbs. Leaves petiolate, deeply crenate or cut; floral similar to the stem ones. Whorls axillary, many-flowered. Bracts subulate spinose.

Species two, belonging to the Mediterranean region.

***M. lævis*** (smooth), Linn; *Benth in D.C. Prod.* 513, and *Fl. Austr.* v. 73. Molucca Balm. A glabrous erect or ascending annual of 1 to 2 ft. Leaves on long petioles, broadly ovate to almost orbicular. Flowers in distant false-whorls of 6, the floral leaves generally smaller, but all on long petioles, the bracts connate at the base. Calyx very large, campanulate, oblique and membranous, the margin 5-angled, with a small point at each angle, attaining sometimes nearly 2 in. diameter. Corolla shorter than the calyx, whitish, the upper lip erect, concave, entire, the lower spreading, 3-lobed. Stamens 4, ascending in pairs under the upper lip. Anthers 2-celled.

Hab.: Naturalized on the Darling Downs and other southern inland localities.

### 17. *LEUCAS*, R. Br.

(From the downy whiteness of the flowers.)

Calyx erect, straight or curved and oblique at the top, 8- to 10-ribbed, 8- to 10-toothed. Corolla-tube not longer than the calyx, the upper lip erect, concave, entire or rarely notched, very villous outside; lower lip spreading, 3-lobed. Stamens 4, ascending in pairs under the upper lip; anthers 2-celled. Style with the upper stigmatic lobe much shorter than the lower. Nuts dry, smooth, triangular, obtuse. Herbs or undershrubs. Flowers in axillary false-whorls, white or rarely purplish.

A considerable genus, spread over tropical and subtropical Asia and Africa.

1. ***L. flaccida*** (weak), R. Br. *Prod.* 505. *Benth. Fl. Austr.* v. 90. An annual with a hard branching decumbent base and ascending or erect flowering branches, often virgate or wiry and above a foot long, the whole plant pubescent or tomentose with soft appressed hairs. Leaves shortly petiolate, ovate, crenate,  $\frac{1}{2}$  to 1 in. long, the upper floral ones small. Flowers 6 to 20 or even more together in axillary false-whorls, the pedicels exceedingly short, the subtending floral leaves usually exceeding the flowers, the bracts within the false whorls very small. Calyx about 3 lines long when in flower and not much enlarged afterwards, straight, 10-ribbed, with 10 short softly subulate teeth, all equal or the alternate ones rather smaller. Corolla white (or blue according to Dallachy), not half as long again as the calyx.—*Benth. in D.C. Prod.* xii. 526.

Hab.: Endeavour River, Banks and Solander; Rockingham Bay, Dallachy; Rockhampton, Bowman, O'Shanesy; Walsh River, R. C. Burton.

Var.? *petiolaris*. Petioles longer than the calyx, as in *L. decumbentata*, but the fragmentary specimens appear to be in an abnormal state, and the calyxes are those of *L. flaccida*.—Cape York, McGillivray.—*Benth.*

2. **L. \*linifolia** (Linum-leaved), *Spreng. Syst.* ii. 743; *Hook. Flora of Brit. Ind.* iv. 690. An erect plant of 2 or 3 ft., stems smooth or scaberulous. Leaves 2 to 4 in. long, and rarely  $\frac{3}{4}$  in. broad, linear or linear-lanceolate, obtuse, entire, or subserrate; petiole none, or on some plants attaining  $\frac{1}{2}$  in. Whorls of flowers axillary and terminal,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter. Bracts setaceous, few and short. Calyx  $\frac{1}{4}$  to  $\frac{1}{2}$  in., obovoid, the upper lip projecting, acute, 3-toothed, lower 2-fid, of a pale colour below, not striate above, sometimes spinescent. Corolla white. Nuts smooth, angular.—*L. lacandulifolia*, Sm. in Rees Cyclop. *Phlomis zeylanica*, Roxb. Fl. Ind. iii. 9; Rumph. Herb. Amb. vi. t. 16, fig. 1.

Hab.: Indian plant. Some years ago I received specimens of what appeared to be this plant from Mr. E. Cowley, Kamerunga, with the note that it was an introduced weed spreading in the Cairns district. I, however, have heard nothing of it since.

The plant has a pleasant aromatic smell, and its flowers are used by the Brahmins to decorate their diety Iswara, according to Roxburg.

## 18. PROSTANTHERA, R. Br.

(From *prostheke*, a process, and *anthera*, an anther.)

(*Chilodia* and *Cryphia*, R. Br. *Klanderia*, F. v. M.)

Calyx-tube usually straight, the limb 2-lipped, the lips entire or the lower one slightly emarginate. Corolla-tube short, dilated into a broad campanulate throat, the upper lip erect, usually short, slightly concave, broadly 2-lobed; the lower lip spreading, 3-lobed, longer or in one section shorter than the upper lip, the middle lobe larger and usually emarginate or 2-lobed. Stamens 4, in pairs; anthers 2-celled, the connective prominent at the back, sometimes cristate and usually produced into one or two linear appendages adnate at the base or in their whole length to the back of the cells, most frequently one of them rarely both free at the end or in a great part of their length, sometimes produced beyond the cell and tipped with a crest or tuft of short points or hairs, but sometimes both appendages very short or obsolete, the anther-cells themselves usually tipped by short points, not crested, and distinct from, although sometimes mistaken for, the ends of the connective appendages. Style shortly bifid at the end. Nuts reticulate-rugose, attached either obliquely at the base or adnate higher up. Seeds albuminous.—Shrubs or undershrubs studded with resinous glands and usually strongly scented. Leaves opposite. Flowers solitary in the axils of the stem-leaves, or opposite in terminal racemes, the floral leaves reduced more or less to deciduous bracts. Pedicels with a pair of bracts usually close under the calyx.

The genus is limited to Australia, the greater number of the species are extratropical.

SECT. I. **Euprostanthera**.—Corolla-throat short and broad, upper lip short, very broad, erect, lower lip much longer with a large spreading middle lobe. Calyx-lips usually closed over the fruit.

SERIES I. **Racemosa**.—Flowers in terminal racemes, the floral ones all or mostly reduced to membranous or broad acuminate or very deciduous bracts.

Leaves mostly above 1 in. long, oblong-lanceolate, on rather long petioles, flat or nearly so. One anther-appendage much longer than the cell.

Corolla pubescent. Bracts narrow . . . . . 1. *P. lasianthos*.

Leaves mostly  $\frac{1}{2}$  in. long or smaller, on rather long petioles, flat or nearly so. Anther-appendages shorter than the cells.

Leaves mostly about  $\frac{1}{2}$  in. long, orbicular ovate or oblong.

Leaves rather thick, mostly entire . . . . . 2. *P. ovalifolia*.

Leaves rather thin, mostly toothed. Lower calyx-lip longer and narrower than the upper one . . . . . 3. *P. incisæ*.

SERIES 2. **Convexa**.—Leaves small or narrow, sessile or shortly petiolate, convex or with revolute margins when dry. Flowers axillary, the floral leaves similar to the stem-ones or rather smaller.

Leaves linear,  $\frac{1}{4}$  to 1 in. long.

Calyx glabrous inside or nearly so. Anther-appendage twice as long as the cell. Plant glabrous or nearly so . . . . . 4. *P. linearis*.

Calyx with a raised transverse pubescent line inside at the base of the upper lip.

Plant glabrous or nearly so. Leaves smooth, mostly  $\frac{1}{2}$  in. or more.

Anther-appendage nearly as long as the cell . . . . . 5. *P. phyllicifolia*.

SERIES 3. **Subconcava**.—Leaves (small or narrow), sessile or very shortly petiolate, concave, or with incurved margins or flat, the margins never recurved. Flowers axillary, the floral leaves similar to the stem ones. Anther-appendage about twice as long as the cell.

Leaves narrow, oblong-linear or lanceolate, mostly  $\frac{1}{2}$  to 1 in. long, quite entire. Plant glabrous or hoary with white appressed hairs.

Branches white. Calyx lips nearly equal . . . . . 6. *P. lithospermoides*

Leaves very narrow-linear and nearly 1 in. long, or linear-oblong and much shorter.

Calyx upper lip large and membranous, lower much smaller. Leaves mostly very narrow.

Calyx upper lip broad, under 5 lines long . . . . . 7. *P. nivea*.

Calyx upper lip ovate,  $\frac{1}{2}$  in. long . . . . . 8. *P. striatiflora*.

Calyx-lips small, nearly equal. Leaves mostly linear-oblong . . . . . 9. *P. saxicola*.

Leaves entire or toothed, usually small and narrow. Plant more or less glandular-pubescent or viscid.

Calyx upper lip larger than the lower. Plant very viscid-pubescent.

Leaves mostly about 3 lines long.

Leaves entire . . . . . 10. *P. odoratissima*.

Leaves prominently toothed or pinnatifid. . . . . 11. *P. euphrasioides*.

SECT. II. **Klanderia**.—Corolla-tube incurved, dilated upwards, the upper lip erect and concave, the lower lip spreading, shorter or not longer. Calyx-lips usually equally open. Anther-appendage small or none.

Leaves petiolate, flat, rather thick, above  $\frac{1}{2}$  in. and often  $\frac{1}{2}$  in. long. Corolla twice as long as the calyx.

Leaves orbicular . . . . . 12. *P. ringens*.

Leaves oblong or scarcely obovate . . . . . 13. *P. Leichhardtii*.

Leaves under 2 lines long, oblong, recurved, thick, the margins not recurved . 14. *P. microphylla*.

1. ***P. lasianthos*** (flowers woolly), *Labill. Fl. Nov. Holl.* ii. 18, t. 157; *Benth. Fl. Austr.* v. 93. A tall shrub, sometimes attaining the dimensions of a moderate-sized tree, glabrous except the flowers. Leaves petiolate, usually oblong-lanceolate, rather acute, serrate, flat or the margins recurved, of a firm consistence, not rugose, dark green above, pale or glaucous and minutely dotted underneath, 2 to 3 in. long; in some specimens shorter broader more entire and almost coriaceous. Flowers opposite in pairs, in short leafless racemes, forming a terminal panicle often leafy at the base, but the leaves under the upper racemes very much reduced and those under the pairs of flowers entirely abortive. Pedicels short. Bracts linear, shorter than the calyx and sometimes very minute. Calyx slightly pubescent, attaining 3 lines when in fruit, the tube obscurely striate, the upper lip broad, the lower rather smaller. Corolla white tinged or spotted with pink or pale blue, hairy inside and out, often  $\frac{1}{2}$  in. long, the lobes very broad. Anthers with the longer appendage about twice as long as the cell, the other short and adnate.—*Br. Prod.* 508; *Benth. in DC. Prod.* xii. 559; *Hook. f. Fl. Tasm.* i. 283; *Andr. Bot. Rep.* t. 641; *Bot. Reg.* t. 143; *Bot. Mag.* t. 2434.

Hab.: Stanthorpe to border of N. S. Wales.

2. ***P. ovalifolia*** (leaves oval), *R. Br. Prod.* 509; *Benth. Fl. Austr.* v. 95. A densely bushy strong-scented shrub, more or less hoary with a minute appressed pubescence. Leaves petiolate, ovate to oblong, obtuse, entire, rather thick and flat, rarely exceeding  $\frac{1}{2}$  in. and mostly smaller. Flowers rather small, in short loose terminal racemes, the floral leaves small, bract-like and deciduous, or the lower pair more leaf-like. Calyx not above 2 lines long, the lips nearly equal and both entire. Corolla purple, about 4 or 5 lines long, slightly pubescent



outside. Anthers with both appendages adnate nearly to the end, and not projecting beyond the cells.—*P. atriplicifolia*, A. Cunn. in Benth. Lab. 451, and in DC. Prod. xii. 560.

Hab.: Shal Bay Passage, *R. Brown*; Wide Bay, *Bidwill*; Killarney and Brisbane River, *Bailey*; Nerang, *H. Schneider*.

Var.? *latifolia*. Leaves broadly ovate or almost orbicular and occasionally with one or two slight crenatures, very much larger than in *P. rotundifolia*, and as much smaller than in *P. cerulea*.—*P. ovalifolia*, Benth. in DC. Prod. xii. 560.

3. ***P. incisa*** (leaves cut), *R. Br. Prod.* 509; *Benth. Fl. Austr.* v. 95. A slender much branched shrub, quite glabrous or more frequently slightly hoary with a minute pubescence. Leaves from ovate-lanceolate to oblong, obtuse, usually bordered by a few coarse teeth, contracted into a rather long petiole, rather thick and flat in some specimens, thinner with the margins slightly recurved in others, green above, pale underneath, mostly  $\frac{1}{2}$  to 1 in. long. Flowers rather small, in short but slender terminal racemes, the lowest pair of floral leaves sometimes like the stem-leaves but smaller, the others reduced to small bracts falling off before the flowering. Pedicels slender, but shorter than the calyx; bracts small. Calyx about 2 lines long or scarcely 3 lines when in fruit, the tube rather broad, striate, pubescent, the upper lip very broad, entire; the lower lip longer, narrower, obtuse, and usually emarginate. Corolla expanding to about 5 lines diameter, the lobes all broad. Anthers with both appendages adnate nearly or the shorter one quite to the end, and neither of them exceeding the cell.—Benth. in DC. Prod. xii. 559.

Hab.: Wellington Point, *J. Wedd*; Macpherson Range, *Schneider* and *Tryon*; Nerang *H. Schneider*.

4. ***P. linearis***, (linear), *R. Br. Prod.* 509; *Benth. Fl. Austr.* v. 100. A tall erect shrub, glabrous or slightly pubescent. Leaves nearly sessile, linear, obtuse, entire, the margins more or less revolute in drying,  $\frac{1}{2}$  in. to above 1 in. long, the upper floral ones similar but smaller. Flowers all axillary, but the upper ones sometimes forming terminal interrupted leafy racemes. Pedicels short. Bracts small, filiform, calyx glabrous or slightly pubescent, about 2 lines long or longer when in fruit, the lips not very broad, nearly equal, entire, without any or only a very slight trace of the transverse downy line of the closely allied species. Corolla sprinkled with a few hairs, or hairy all over, about twice as long as the calyx. Stamens longer than in most species of this section, and the anther-cells more divergent; the longest appendage nearly twice as long as the cell, the other short and adnate.

Hab.: Wellington Point, *J. Wedd*.

5. ***P. phyllicifolia*** (Phylla-like leaves), *F. v. M. Fragm.* i. 19; *Benth. Fl. Austr.* v. 100. A robust bushy shrub sometimes small but attaining often several ft., glabrous or hoary-pubescent with very short somewhat crisped hairs. Leaves sessile or nearly so, oblong, linear, obtuse, entire, with revolute margins, usually thicker and broader than in *P. linearis*, in some specimens all under  $\frac{1}{2}$  in., in others  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Flowers all axillary. Pedicels shorter than the calyx, with linear-setaceous bracts close under the calyx, or at some distance from it. Calyx 2 to 2 $\frac{1}{2}$  or rarely 3 lines long, the tube prominently striate, the lips ovate, the upper one with a transverse rather broad cottony line inside at the base, the lower one at first nearly equal to, at length much smaller than, the upper one. Corolla whitish, glabrous or very sparingly pubescent, nearly twice as long as the calyx. Anther-appendages short and adnate or one of them with a small point not cristate and scarcely exceeding the cell.

Hab.: Glass-house Mountains.

6. **P. lithospermoides** (Lithospermum-like), *F. v. M. Fragm.* vi. 107. *Benth. Fl. Austr.* v. 101. A shrub of 6 to 8ft., hoary with appressed hairs, the young shoots silky. Leaves very shortly petiolate or nearly sessile, oblong-lanceolate or almost linear, obtuse or acute, entire, flat or concave, the margins not recurved, the larger ones 1 to 2in. long, the floral ones smaller but similar. Flowers axillary, on very short pedicels. Bracts nearly as long as the calyx. Calyx silky-pubescent, about  $2\frac{1}{2}$  lines long, the lips nearly equal, entire, or sinuate-toothed. Corolla white (*F. v. M.*) or blue (*O'Shanesy*), softly pubescent, not twice as long as the calyx. Anthers with one appendage about twice as long as the cell, the other short and adnate.

Hab.: Table Mount, Rockhampton, *O'Shanesy*; Armadilla, *W. Barton*; Mt Perry, *J. Keys*.

7. **P. nivea** (snow-white), *A. Cunn. in Benth. Lab. Gen. et. Sp.* 452, and in *DC. Prod.* xii. 561; *Benth. Fl. Austr.* v. 103. A beautiful shrub of 3 to 6ft., glabrous except the corolla or sprinkled with a few appressed hairs, especially on the young shoots, and usually of a pale green. Leaves sessile, linear-terete with incurved or involute margins, or flat when fresh, acute or obtuse, rather slender, mostly  $\frac{1}{2}$  to 1in. long, the upper floral ones smaller. Flowers rather large, of a snow-white or tinged with pale blue, all axillary, the upper ones forming interrupted leafy racemes. Pedicels much shorter than the calyx, with short setaceous bracts. Calyx  $2\frac{1}{2}$  to 3 lines long when in flower and not much enlarged afterwards, slightly pubescent, the tube prominently ribbed, the lips broad and ciliate, the upper one much larger than the lower. Corolla pubescent or villous, twice as long as the calyx. Anthers with one appendage about twice as long as the cell, the other short and adnate.—*Bot. Mag. t. 5658.*

Hab.: Near Stanthorpe.

8. **P. striatiflora** (flowers streaked), *F. v. M. in Linnaea*, xxv. 425; *Benth. Fl. Austr.* v. 103. A rigid much branched shrub, sometimes quite low, sometimes attaining 5 or 6ft., glabrous or the young shoots hoary or silky with short appressed hairs, the smaller branches sometimes almost spinescent. Leaves sessile or nearly so, oblong-lanceolate or linear, mostly obtuse, entire, flat or with incurved margins, rather thick, usually under  $\frac{1}{2}$ in. long, but when narrow often  $\frac{3}{4}$ in., the floral ones gradually smaller, the upper ones shorter than the calyx. Flowers all axillary, but the upper ones crowded into terminal leafy racemes or spikes. Pedicels very short. Calyx-tube not two lines long, prominently striate, the upper lip ovate, obtuse, often  $\frac{1}{2}$ in. long when in fruit, the lower lip not half so large. Corolla nearly twice as long as the calyx, glabrous or sprinkled with a few hairs, white streaked with red and tinged with yellow at the base of the broad middle lobe of the lower lip. Anthers with one appendage about twice as long as the cell, the other short and adnate.

Hab.: Newcastle Range, *Sutherland*; Stanthorpe.

The species is very nearly allied to *P. nivea*, and sometimes difficult to distinguish from it. In general it has shorter broader leaves, a more dense inflorescence, the upper lobe of the calyx longer and not so broad, and the corolla more glabrous.—*Benth.*

9. **P. saxicola** (growing in stony places), *R. Br. Prod.* 509; *Benth. Fl. Austr.* v. 104. A slender shrub or undershrub, sometimes having the appearance of a rigid annual; the stems much branched at the base and ascending to from 6in. to 1ft. in the typical form, more erect and attaining 2ft. in others, hoary with minute appressed hairs or nearly glabrous. Leaves very shortly petiolate or nearly sessile, oblong or linear-oblong, obtuse, entire, flat, rather thick, 2 to 4 lines long in the typical form, the young ones sprinkled with appressed hairs, the older ones usually glabrous. Flowers small, in few pairs in the upper axils. Pedicels short, with setaceous bracts. Calyx about 2 lines long, more or less hispid with spreading hairs especially in the small typical specimens, the lips

nearly equal. Corolla nearly twice as long as the calyx, glabrous or slightly pubescent. Anthers with one appendage about twice as long as the cell, the other short and adnate.

Hab.: Wallangarra border of N. S. Wales.

Var. *major*. Taller, more shrubby, leaves longer and narrower, calyx less hispid and sometimes almost glabrous.—*P. saricola*, A. Cunn.; Benth. in DC. Prod. xii. 562; *P. pimeleoides*, F. v. M. Fragm. vi. 107.

10. **P. odoratissima** (very fragrant), *Benth. in. Mitch. Trop. Austr.* 291, and in DC. Prod. xii. 700, and in *Fl. Austr.* v. 104. A small erect bushy shrub or undershrub, more or less pubescent with glandular hairs, the branches and foliage apparently viscid and very strongly scented. Leaves sessile and often clustered in the axils, linear or almost lanceolate, obtuse, entire, thick, flat or concave, the margins never recurved, mostly about  $\frac{1}{2}$  in. long. Flowers axillary, on short pedicels, the bracts linear, obtuse, thick and often as long as the calyx. Calyx  $2\frac{1}{2}$  lines or at length 3 lines long, rather narrow, prominently striate, the lips ovate, the upper one considerably longer than the lower. Corolla not seen perfectly open, glabrous outside when in bud. Anthers with one appendage about twice as long as the cell, the other short and adnate.

Hab.: Mantuan Downs, *Mitchell*.

11. **P. euphrasioides** (Euphrasia-like), *Benth. in. Mitch. Trop. Austr.* 360, and in DC. Prod. xii. 700, and in *Fl. Austr.* v. 104. A small bushy shrub, villous with white spreading hairs intermixed with glandular ones and often viscid. Leaves on very short petioles or almost sessile, often clustered in the axils, linear-oblong, obtuse, with 2 or 3 prominent obtuse teeth on each side or almost pinnatifid, mostly about 3 lines long, rather thick, flat, the margins never recurved. Flowers all axillary, rather large. Pedicels short but slender. Bracts linear, obtuse, rather long. Calyx pubescent or hirsute, about 3 lines or at length sometimes 4 lines long, the lips entire, broad, the upper one usually larger than the lower. Corolla more than twice as long as the calyx, nearly glabrous outside, hairy inside. Anthers with one appendage about twice as long as the cell, the other short and adnate.

Hab.: On the Maranoa, *Mitchell*; Hodgson's Creek and Dogwood Creek, *Leichhardt*; Cape River and Broudsound, *Bowman*; Main Range, Toowoomba, *C. H. Hartmann*.

12. **P. ringens** (gaping), *Benth. in. Mitch. Trop. Austr.* 363, and in DC. Prod. xii. 700, and in *Fl. Austr.* v. 106. A much branched shrub, glabrous or the branches slightly pubescent. Leaves on rather long petioles, broadly ovate or orbicular, obtuse, entire, rather thick, flat, under  $\frac{1}{2}$  in. diameter. Flowers all axillary, on very short pedicels. Calyx glabrous, herbaceous, scarcely striate, fully 3 lines long, the lips broad, equal, entire, not half so long as the tube. Corolla-tube shortly exerted, the upper lip concave, 2-lobed, longer than the lower one. Stamens nearly as long as the corolla; anthers without any prominent appendages to the connective.

Hab.: On the Maranoa, *Mitchell*; Mt. Perry, *J. Keys*.

13. **P. Leichhardtii** (after L. Leichhardt), *Benth. Fl. Austr.* v. 106. A bushy shrub, the branches slightly pubescent, the foliage glabrous or nearly so. Leaves distinctly petiolate, oblong or obovate-oblong, obtuse, entire, rather thick, flat, rarely exceeding  $\frac{1}{2}$  in. Flowers apparently all axillary, on very short pedicels, without bracts on the specimens seen. Calyx about 3 lines long when in flower, somewhat enlarged afterwards, the tube broad, scarcely striate, the lips equal, entire, scarcely half as long as the tube. Corolla slightly hairy outside, the tube shortly exceeding the calyx and scarcely dilated, the upper lip 4 to 5 lines long,

concave, emarginate, the lobes of the lower lip much shorter, all fringed with rather long hairs. Stamens nearly as long the upper lip of the corolla; anthers without any prominent appendages to the connective.

Hab.: Bottle-tree Creek, *Leichhardt*.

F. v. M. (*Fragm.* vi. 106) includes this in *P. ovalifolia* of which it has nearly the foliage, but the flowers are totally different. It is very near to *P. ringens*, but with differently shaped leaves, and perhaps the corollas may not be quite the same. The two will require further comparison on better specimens.—*Benth.*

14. **P. microphylla** (leaves small), *A. Cunn. in Benth. Lab. Gen. et. Sp.* 454 and in *DC. Prod.* xii. 562; *Benth. Fl. Austr.* v. 106. A low bushy or scrubby shrub rarely above 1 ft. high, more or less scabrous-pubescent. Leaves very shortly petiolate, oblong or rarely oval-oblong, obtuse, thick, recurved from the base to the end, but without recurved or revolute margins, often all under 1 line long and very rarely exceeding 2 lines. Pedicels axillary, much shorter than the calyx and often not above  $\frac{1}{2}$  line long. Bracts small, close under the calyx. Calyx obscurely striate, pubescent or nearly glabrous, usually about 3 lines or rarely 4 lines long, the lips much shorter than the tube, equal and obtuse. Corolla scarlet, slightly pubescent, fully twice as long as the calyx, the tube exserted and slightly incurved, enlarged upwards, the upper lip erect, concave, emarginate, the lower lip much shorter. Stamens exserted but shorter than the upper lip; anthers with one appendage about as long as or shortly exceeding the cell, but very delicate and easily overlooked.—*Benth.* in *DC. Prod.* xii. 562; *P. coccinea*, F. v. M. in *Hook. Kew. Jl.* viii. 168 and in *Trans. Phil. Soc. Vict.* i. 48.

Hab.: Toowoomba, *P. H. Hartmann, (F. v. M.)*.

### 19. HEMIGENIA, R. Br.

(From *hemi*, half, and *genœa*, an offspring; in reference to only one of the cells of each anther being fertile.)

Calyx 2-lipped or 5-toothed. Corolla with a dilated throat; the upper lip erect, more or less concave, emarginate or 2-lobed, the lower lip longer, spreading, 3-lobed, the middle lobe usually larger and often 2-lobed. Stamens 4, in pairs; anthers 1-celled, the connective elongated, produced beyond the insertion into an appendage or sterile branch, which in the upper pair is usually short dilated and bearded or crested at the end with short hairs, in the lower pair or rarely in both pairs glabrous and attenuate or bearing an imperfect cell at the end. Style shortly bifid at the end. Nuts reticulate-rugose, attached to the middle or higher up. Seeds albuminous.—Shrubs or undershrubs. Leaves opposite or in whorls of 3, entire, obtuse or rarely acute and never pungent pointed. Flowers all axillary, solitary or rarely in clusters, with a pair of bracts under the calyx. Corolla hairy inside at the insertion of the stamens, and usually at the base of the lower lip.

The genus is limited to Australia.

1. **H. Biddulphiana** (after Miss H. S. Biddulph), *F. v. M. Vict. Nat. Sept.* 1890. A rather dwarf plant, almost glabrous except the flowers. Leaves faintly dotted,  $1\frac{1}{2}$  to 2 in. long, mostly lanceolate, flat or the margins slightly recurved, opposite or ternate, on very short petioles. Flowers axillary, solitary or in pairs, on very short pedicels, bearing at the base very short linear acute bracteoles. Calyx 3 to 4 lines long, glandularly hairy, the lobes hardly half as long as the tube, almost equal, deltoid and somewhat acuminate. Corolla probably white, nearly twice as long as the calyx, the outside bearing minute spreading hairs, the 2 upper lobes considerably shorter than the 3 lower ones, tube almost campanulate inside near the orifice, bearing crisp hairs. Anthers of the upper stamens 1-celled, augmented by a large somewhat membranous blunt appendage; anthers

of the lower stamens 2-celled, one of the cells distant and diminutive. Pollen dark-purple. Style glabrous, quite enclosed; stigma extremely narrow. Nuts roughly reticulate, obliquely obovate, slightly compressed, about  $1\frac{1}{2}$  line long, brown.

Hab.: Near Mt. Playfair, *Miss H. S. Biddulph* (F. v. M.).

## 20. WESTRINGIA, Sm.

(After J. P. Westring, a physician to the King of Sweden.)

Calyx campanulate, 5-toothed. Corolla with a short tube and dilated throat; the upper lip erect but flat and broadly 2-lobed, the lower spreading, 3-lobed. Stamens 2 (the upper ones) perfect, the anthers 1-celled with a short slightly prominent connective not produced below its insertion on the filament, the 2 lower stamens (or staminodia) sterile and short, the anthers reduced to a small connective with 2 linear or linear-clavate parallel branches. Style shortly bifid at the end. Nuts reticulate-rugose, attached to the middle or higher up. Seeds albuminous.—Shrubs. Leaves in whorls of three, four or rarely more, all entire, Flowers all axillary or rarely in leafy heads, with a pair of bracts under the calyx usually very small and sometimes almost obsolete. Corolla usually hairy inside the tube, especially at the insertion of the stamens.

The genus is limited to Australia. With the exception of the West Australian species *W. Cephalantha*, the species are so closely allied, and run so much into each other as to render it exceedingly difficult to assign to them any tangible characters. The chief differences observed are in the number of leaves in the whorl, in the relative abundance or absence of the hoary tomentum, and in the length of the teeth of the calyx, none of which are quite constant in any one species. The corolla might perhaps in some instances supply better characters, but they can only be ascertained by the observation of living specimens; the want of any concavity in the upper lip at once distinguishes the genus from *Microcorys*.—*Benth.*

Flowers all in the axils of leaves not differing from the stem ones (distant or crowded at the ends of the branches).

Leaves very white underneath, often not much revolute. Calyx teeth above half as long as the tube.

Leaves in threes, oblong-elliptical,  $\frac{1}{2}$  to 1 lin. long . . . . . 1. *W. grandifolia*.

Leaves in fours, oblong-lanceolate or linear,  $\frac{1}{2}$  to 1 lin. long . . . . . 2. *W. rosmariniformis*.

Leaves very much revolute, rigid, mostly in threes. Calyx teeth very short. . . . . 3. *W. rigidn*.

Leaves narrow-linear, slender, much revolute, mostly in threes.

Calyx-teeth as long as the tube . . . . . 4. *W. eremicola*.

Leaves not much revolute or flat, in threes, oblong-elliptical or lanceolate, under 1 lin. long, green on both sides as well as the calyx . . . . . 5. *W. glabra*.

### 1. *W. grandifolia*, (leaves large), *F. v. M. Herb.*; *Benth. Fl. Austr.* v. 123.

A tall shrub with the habit and white indumentum of *W. rosmariniformis*. Leaves in whorls of 3, oblong-elliptical,  $\frac{1}{2}$  to 1 lin. long, the margins slightly revolute, green above and white underneath. Flowers all axillary. Calyx very white, about 4 lines long, the teeth nearly as long as the tube. Corolla pubescent, nearly that of *W. rosmariniformis*, but the lobes appear to be shorter and broader, and the upper lip rather shorter than the lower.

Hab.: Glasshouse Mountains, *F. v. Mueller*; and probably the same species but the specimens not in flower, *Biroa, Leichhardt*.

2. *W. rosmariniformis* (Rosemary-like), *Sm. Tracts*, 282, t. 3; *Benth. Fl. Austr.* v. 123. A robust bushy shrub of several ft., the branches underside of the leaves and calyxes hoary or silvery-white with densely appressed hairs. Leaves in whorls of 4, oblong-lanceolate lanceolate or linear, acute or obtuse,  $\frac{1}{2}$  to 1 lin. long, coriaceous, glabrous and shining an the upper side, the margins more or less recurved or revolute. Flowers almost sessile, all axillary, with short linear bracts. Calyx about 3 lines long, the teeth acute, varying from half the length to nearly the length of the tube. Corolla pubescent outside, not twice as long as the

calyx, the upper lip deeply 2-lobed, equal to or longer than the tube, the lower lip scarcely so long. Anthers of the staminodia with 2 linear clavate parallel lobes. Nuts glabrous, reticulate-rugose.—Benth. in DC. Prod. xii. 570; R. Br. Prod. 501; *Cunila fruticosa*, Willd. Spec. Pl. i. 122; *W. rosmarinacea*, Andr. Bot. Rep. t. 214.

Hab.: Southern localities.

3. **W. rigida** (rigid), R. Br. Prod. 501; Benth. Fl. Austr. v. 129. A rigid bushy scrubby shrub, sometimes hoary all over or green all over, usually the young shoots and underside of the leaves only hoary and never so white as in *W. rosmariniformis*. Leaves mostly in whorls of 3, but here and there of 4, linear, obtuse or mucronate-acute, rigid with much revolute margins, usually glabrous above when full-grown and either smooth or shining or scabrous with minute tubercles, varying from scarcely 2 lines long and thick and broad in some specimens, to above  $\frac{1}{2}$  in. and more slender in others, with every intermediate size. Flowers axillary, nearly sessile, with very short teeth to the calyx, which varies from very hoary to quite green. Corolla hirsute.—Benth. in DC. Prod. xii. 570; Bartl. in Pl. Preiss. i. 361; *W. grevillina*, F. v. M. in Hook. Kew. Journ. viii. 169 and in Trans. Phil. Soc. Vict. i. 49.

Hab.: Roma, Rev. B. Scortechini.

4. **W. eremicola** (found in dry places), A. Cunn. in Benth. Lab. Gen. et Sp. 459, and in DC. Prod. xii. 571; Benth. Fl. Austr. v. 130. A shrub of several feet with erect often virgate rather slender branches more or less hoary or silky pubescent as well as the leaves with appressed hairs, the older foliage becoming glabrous. Leaves usually in whorls of 3, narrow-linear, acute or mucronate, with revolute margins, more slender than in the preceding species and rarely above  $\frac{1}{2}$  in. long. Flowers rather small, usually distant. Calyx hoary, the tube about  $1\frac{1}{2}$  line long, the teeth subulate or rarely lanceolate-subulate, as long as or sometimes longer than the tube. Corolla pubescent outside, smaller than in any of the preceding species the upper lip shorter than the middle lobe of the lower lip and not deeply lobed, the lobes all rather narrow and emarginate.—Bot. Mag. t. 3438; *W. longifolia*, Lindl. Bot. Reg. t. 1481, not of R. Br.

Hab.: Brisbane River, Moreton Bay, F. v. Mueller, C. Stuart; Wellington Point, J. Wedd; Helidon, Bailey.; Logan, Dr. J. Bancroft.

5. **W. glabra** (glabrous), R. Br. Prod. 501; Benth. Fl. Austr. v. 131. A bushy shrub of 2 or 3 ft., quite glabrous or the young branches slightly silky-pubescent, the leaves on both sides and the calyxes quite green. Leaves in whorls of 3, shortly petiolate, from oblong-elliptical to lanceolate, from under  $\frac{1}{2}$  in. to nearly 1 in. long, acute or obtuse, flat or the margins slightly recurved, smooth and often shining on the upper surface. Flowers rather small axillary, the calyx-teeth usually lanceolate, about as long as the tube.—Benth. in DC. Prod. xii. 571; *W. violacea*, F. v. M. in Hook. Kew Journ. viii. 169, and in Trans. Phil. Soc. Vict. i. 49.

Hab.: Shoalwater Bay, R. Brown; Dawson River, Dr. J. Bancroft.

## 21. TEUCRIUM, Linn.

(After Teucer, King of Troy.)

Calyx-teeth 5, equal or the upper one more frequently larger than the others. Corolla-tube short, the 4 upper lobes nearly equal or the 2 uppermost larger, all 4 lateral, erect or declinate, the middle lower lobe larger, obovate or oblong, spreading and usually concave. Stamens 4, in pairs, exerted from between the

upper corolla-lobes and arched over the corolla. Anthers reniform, 1-celled by confluence of the cells. Style shortly bifid at the end. Nuts laterally attached to near or to above the middle, reticulate-rugose or rarely nearly smooth.—Herbs undershrubs or shrubs, showing considerable diversity in habit and inflorescence. Leaves entire, toothed or variously divided.

The genus is widely distributed over the temperate regions of the globe, chiefly in the northern hemisphere, with a few tropical chiefly mountain species.

Peduncles longer than the calyx, 1 or more flowered.

- |                                                                                                                                                                        |                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Plant hoary or white, rigid. Leaves mostly entire. Peduncles rigid, all 1-flowered . . . . .                                                                           | 1. <i>T. racemosum</i> .     |
| Plant green, nearly glabrous. Leaves mostly entire. Peduncles slender all 1-flowered or the lower ones 3 or 5 flowered . . . . .                                       | 2. <i>T. integrifolium</i> . |
| Plant green, pubescent or villous. Leaves toothed or cut or the upper ones entire. Peduncles slender, 3 or more flowered . . . . .                                     | 3. <i>T. corymbosum</i> .    |
| Flowers sessile or nearly so. Flowers in axillary cymes. Leaves mostly 3 to 6 or more lobed. Corolla with a tuft of white hairs on either side in the throat . . . . . | 4. <i>T. ajugaceum</i> .     |
| Flowers in terminal spikes. Leaves toothed or rarely lobed. Corolla with all 4 upper lobes small and distant . . . . .                                                 | 5. <i>T. argutum</i> .       |

1. ***T. racemosum*** (racemose), *R. Br. Prod.* 504; *Benth. Fl. Austr.* v. 132. A perennial or undershrub with a woody rootstock and erect rigid more or less branched stems, from 6in. to above 1ft. high, hoary or white as well as the foliage and inflorescence, with a close minute tomentum scarcely wearing off from the upper surface of the older leaves. Stem-leaves linear-lanceolate or oblong-linear, obtuse, entire or very rarely 3-lobed, contracted into a short petiole, from under  $\frac{1}{2}$ in. to above 1in. long, the margins sometimes recurved and occasionally undulate-crisped; the lower leaves in some specimens 3 together on each side of the stem; the upper and floral ones gradually smaller, more sessile, broader at the base, the uppermost very small. Peduncles all 1-flowered, rigid, spreading, as long as or longer than the floral leaf, forming a stiff terminal more or less leafy raceme. Calyx 2 to  $2\frac{1}{2}$  lines long, the teeth nearly equal, as long as or longer than the tube. Corolla-limb sparingly hirsute outside, the 4 upper lobes in lateral pairs, all nearly equal oblong and erect, the middle lower one twice as long. Nuts more or less pubescent, the adnate part of the inner face very hard.—*Benth.* in *DC. Prod.* xii. 576.

Hab.: In the interior, *Mitchell*; Armadilla, *W. Barton*; Curriwillinghamie, *Dalton*; Mt. Abundance and Boulia, *Bailey*; Musgrave, *T. Barclay-Millar*.

2. ***T. integrifolium*** (leaves entire,) *F. Muell. Herb. Benth. Fl. Austr.* v. 133. An erect perennial of 6in. to 1ft., with the habit of some forms of *T. racemosum*, with which *F. v. M* now unites it, but not so rigid and without any of the white tomentum so constant in that species, the calyx and young shoots very rarely slightly pubescent or hirsute and the corolla usually hirsute outside, the rest of the plant glabrous. Leaves lanceolate oblong or almost linear, the lower ones petiolate and  $\frac{1}{2}$  to 1in. long, the upper floral ones smaller and more sessile, all entire. Peduncles much more slender than in *T. racemosum*, but mostly shorter than the leaves, the upper ones and sometimes all 1-flowered, the lower ones often 3- or 5-flowered as in *T. corymbosum*. Nuts pubescent.

Hab.: In the interior, *Mitchell*; Bowen River, *Bowman*; Flinders River, *Sutherland*; Sutor River, *Dorsay*; Armadilla, *W. Barton*; Curriwillinghamie, *Dalton*; Glenormiston, *Coghlan*; Dar River, *Chas. W. de Burgh-Birch*.

This species closely connects *T. racemosum* and *T. corymbosum*, being as near to the one as to the other, and, as appears to me, cannot well be referred to either without uniting all three into one.—*Benth.*

3. ***T. corymbosum*** (corymbose,) *R. Br. Prod.* 504. *Benth.* v. 133, *Fl. Austr.* An erect perennial, not usually much branched, from under 1ft. to 3ft. high, pubescent with very short hairs passing sometimes into a hoary tomentum on

the under side of the leaves; thin leaves mostly ovate or ovate-lanceolate, irregularly and deeply toothed or lobed, contracted into a distinct petiole, more or less rugose, green on both sides or hoary underneath, 1 to 1½ in. long, passing into smaller, narrower and less cut floral leaves, which are sometimes as well as the upper stem ones all entire or slightly toothed, or all the leaves are oblong or broadly lanceolate and more regularly toothed, or all are rather broad or deeply lobed. Peduncles slender, shorter or longer than the leaves, bearing a loose cyme of 3 to 7 or rarely more flowers, usually rather smaller than in *T. racemosum*, but sometimes at least as large, otherwise the same as in that species, the calyx-teeth nearly equal and as long as or longer than the tube, the 4 upper lobes of the corolla nearly equal and oblong, the middle lower one twice as long. Nuts pubescent.—Benth. in DC. Prod. xii. 577, Hook. f. Fl. Tasm. i. 285; *Scoparia australis*, Sieb. in Schult. Syst. iii. Mant. 66; *Anisomeles australis*, Spreng. Syst. Cur. Post. 226.

Hab.: Killarney, *C. J. Greyther*.

Var. *hirsutum*. The whole plant viscid and hirsute with rather long spreading hairs. Leaves rather large, contracted into a very short petiole or quite sessile. Cymes loose, several flowered. Perhaps a distinct species.

Hab.: Mountain tops near Rockhampton, *Bowman*, *O'Shanesy*; Liverpool Range, *Leichhardt*.

4. ***T. ajugaceum*** (Ajuga-like), *Bail. et F. v. M.*; 2nd Suppl. Syn. Ql. Fl. 48. A densely hairy perennial with procumbent quadrangular branches often extending to several feet in length. Leaves 6 to 9 lines long and about as wide, in distant sessile pairs, 3 to 6 or more lobed, cuneate towards the base. Flowers axillary, in short cymes; few flowers, seldom much exceeding the leaves. Calyx about 3 lines long; teeth acute, of equal length with the tube. Corolla exceeding the calyx by about ½ in., slightly pubescent outside, with a tuft of white hairs on either side in the throat; upper lip oblong, about equal in length with the lateral lobes of the lower lip; middle lobe much larger and very obtuse. Stamens more or less hairy, densely so close under the anther. Nuts glabrous.

Hab.: Musgrave Electric Telegraph Station—*T. Barclay-Millar*.

5. ***T. argutum*** (alluding to the sharp calyx-teeth and bracts), *R. Br. Prod.* 504; *Benth. Fl. Austr.* v. 135. A perennial with erect simple or slightly branched stems of 6 in. to 1 ft., the whole plant pubescent or hirsute but green. Leaves on rather slender petioles, ovate-lanceolate or ovate, sometimes hastate, regularly serrate or crenate, or rarely less regularly toothed or lobed, more or less rugose, mostly from ¾ to 1½ in. long, the floral ones reduced to small lanceolate or rarely ovate persistent bracts. Flowers not very constantly opposite, sessile or shortly pedicellate, in loose or dense terminal spikes. Calyx 2 to 3 lines long, the teeth acute, shorter than the tube, the upper ones especially the uppermost one rather broad, the 2 lowest narrow. Corolla with the 4 upper (lateral) lobes very small acute and distant, the middle lower lobe much larger and obovate. Nuts glabrous.—Benth. in DC. Prod. xii. 584.

Hab.: Gilbert River, *F. v. Mueller*; Port Denison, *Fitzalan*, *Dallachy*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*, *Dallachy*; Nerook Creek and Bowen River, *Bowman*; Moreton Bay, *Backhouse*; near Mount Owen, *Mitchell*; common in many localities.

Var. *incisa*. Leaves small, mostly lobed.—Dawson River, *F. v. Mueller*; Darling Downs, *Lau*; Armadilla, *W. Barton*.

## 22. AJUGA, Linn.

(Alluding to the calyx being equal-toothed, not yoked.)

Calyx-teeth 5, equal. Corolla-tube short or long, the upper lip very short, truncate or emarginate, the lower lip long and spreading, the lateral lobes oblong, small, the middle lobe much larger, emarginate or bifid. Stamens 4, in pairs,



exserted from the upper lip and arched over the corolla; anthers reniform, 1-celled by the confluence of the cells. Style shortly bifid at the end. Nuts laterally attached to near or above the middle, reticulate-rugose.—Herbs, usually diffuse or ascending or with spreading radical leaves and shortly erect stems. Flowers in false-whorls in the axils of floral leaves gradually smaller than the stem-leaves, the upper ones sometimes forming terminal leafy spikes. Bracts linear, or very small or none.

The genus is widely dispersed over the extratropical regions of the Old World, and chiefly in the mountain districts within the tropics, but wanting in America.

1. **A. australis** (Australian), *R. Br. Prod.* 503; *Benth. Fl. Austr.* v. 136. A perennial, more or less pubescent or villous, without stolones, with erect or ascending simple stems from 2 or 3 in. to above 1 ft. long, flowering nearly from the base. Leaves chiefly radical, obovate or oblong, coarsely toothed, contracted into a long petiole, often 3 to 4 in. or sometimes still longer; lower floral leaves nearly similar or smaller and narrower, passing into sessile oblong or lanceolate entire lobes, all longer than the flowers or the upper ones very small. Flowers blue, nearly sessile, in false-whorls of from about 6 to above 20, exceedingly variable in size. Bracts linear, the outer ones sometimes as long as the calyx, the inner ones or nearly all very small or obsolete. Calyx villous or nearly glabrous, from about 2 lines to nearly 4 lines long, the teeth acute, shorter than the tube. Corolla-tube from the length of the calyx to twice as long, always with a transverse ring of hairs inside above the ovary, the upper lip truncate or emarginate, sometimes exceedingly short, in some of the larger flowers nearly one line long, but always twice as broad as long, and never longer than the space between the base of the lower lip and the lateral lobes; the middle lobe of the lower lip usually longer than the tube. Nuts glabrous.—*Benth.* in *DC. Prod.* xii. 597; *Hook. f. Fl. Tasm.* i. 286; *A. diemenica*, *Benth. Lab. Gen. et. Sep.* 695 and in *DC. Prod.* xii. 597; *A. virgata* and *A. tridentata*, *Benth. Lab. Gen. et. Sep.* 700, 701; and in *DC. Prod.* xii. 601, 602.

Hab.: Keppel Bay, *R. Brown*; Percy Isles, *A. Cunningham*; Port Curtis, *M. Gillivray*; Rockingham Bay and Rockhampton, *Dallachy* and others; Moreton Bay, *C. Stuart*; Mount Faraday, *Mitchell*. A most variable plant both in leaf and flower.

## ORDER XCVII. PLANTAGINEÆ.

Flowers regular. Sepals 4. Corolla small, scarious, with an ovate or cylindrical tube and 4 spreading lobes, imbricate in the bud. Stamens 4, or rarely fewer, inserted in the tube of the corolla and alternate with its lobes, usually long; anthers 2-celled, the cells parallel, opening longitudinally. Ovary free, 1- 2- or 4-celled, with one or more ovules in each cell. Style simple, terminal, entire, with 2 opposite longitudinal stigmatic lines. Capsule opening traversely or indehiscent. Seed peltate, laterally attached, albuminous. Embryo straight or slightly curved, parallel to the hilum.—Herbs with radical tufted or spreading leaves, rarely branched and leafy. Flowers in heads or spikes or rarely solitary, on leafless axillary peduncles, each one sessile within a small bract.

A small Order, widely spread over the globe, but chiefly in the temperate regions of the Old World.

### 1. **PLANTAGO**, Linn.

(Name used by Pliny.)

Flowers hermaphrodite, in heads or spikes. Stamens 4. Capsule 2- or 4-celled; the other characters those of the Order.

The geographical range of the genus is the same as that of the Order. The characters derived from the exserted or included styles or stamens have been shown by A. Gray to be dimorphic or subsexual and not specific, and there remains often little to be relied upon but the shape of the leaves, the density of inflorescence, the size of the flowers and similar eminently variable differences.—*Benth.*

- Ovary 2-celled, with usually more than 2 superposed pairs of ovules in each cell . . . . . 1. *P. \*major*.  
 Ovary 2-celled, with 1 ovule in each cell. Flowers in very dense ovate or broadly oblong spikes or heads . . . . . 2. *P. \*lanceolata*  
 Ovary 2-celled, with 2 ovules in each cell without spurious dissepiments. Spikes very slender, interrupted. Flowers small. Leaves usually rather broad. Calyx not exceeding  $\frac{3}{4}$  line . . . . . 3. *P. debilis*.  
 Spikes rigid, not very close, above 1in. long (excepting depauperated specimens with few flowers). Leaves usually narrow. Calyx 1 to  $1\frac{1}{2}$  line long . . . . . 4. *P. varia*.

1. **P. \*major** (the greater,) Linn; *Dcne. in DC. Prod.* xiii. i. 694. A perennial, glabrous or hairy; rootstock stout truncate. Leaves oblong or oblong-ovate, sub-entire or toothed, 3- to 7-ribbed, 2 to 5in. long, of variable width, the petioles about 3 or 4in. Scape short; spike 3 to 6in., or sometimes longer. Flowers scattered or crowded. Bracts long as the calyx. Sepals glabrous, 2 lines long, margins broadly scarious, obtusely keeled. Filaments short. Seeds black, very minute.—*P. asiatica*; Linn. Wight. Ill. t. 177.

Hab.: A widely spread weed. Introduced by cultivation.

2. **P. \*lanceolata** (lanceolate), Linn.; *Dcne. in DC. Prod.* xiii. i. 714; *Benth Fl. Austr.* v. 138. Stock usually more or less woolly or silky-hairy. Leaves radical, lanceolate or oblong-lanceolate, acute, entire or minutely and obscurely toothed, contracted at the base, more or less hairy or glabrous. Scapes long. Flowers in a close dense ovate spike or head, often becoming oblong when old. Lower sepals usually united almost to the top. Ovary 2-celled with only one ovule in each cell.

Hab.: A weed of Europe and temperate Asia, met with as a stray from cultivation paddocks.

3. **P. debilis** (weak), *R. Br. Prod.* 425; *Benth. Fl. Austr.* v. 139. Very near *P. varia*, and according to F. v. M. only a variety of that species. Stock without any or with only a few long woolly hairs between the leaves, the foliage and inflorescence hirsute or nearly glabrous. Leaves radical, oblong or lanceolate, entire or toothed, usually broader and shorter than in *P. varia*. Scapes very slender, from 2 or 3in. to 1ft. high, the flowers all distant when fully out, and much smaller than in *P. varia*, forming a slender interrupted spike often occupying above half the scape. Calyx not exceeding  $\frac{3}{4}$  line when in fruit and still smaller at the time of flowering, the opaque centre of the sepals with a few appressed hairs or more frequently glabrous. Ovary 2-celled, with 2 collateral ovules in each cell. Capsule with 4 or fewer seeds.—*Dcne. in DC. Prod.* xiii. i. 701.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller, C. Stuart*; Armadilla, *W. Barton*; widely spread but not so common as *P. varia*.

4. **P. varia** (various), *R. Br. Prod.* 424; *Benth. Fl. Austr.* v. 139. A perennial often flowering the first year so as to appear annual, but forming ultimately a thick stock with the membranous dilated imbricate bases of the leaves enveloped in long reddish brown woolly or silky hairs sometimes very copious, in other specimens very few or scarcely any. Leaves all radical, erect or rosulate, usually lanceolate or linear-lanceolate, entire or bordered by a few teeth, with 1, 3 or 5 nerves prominent underneath, contracted into a long petiole, more or less hirsute, the whole leaf under 2in. in some specimens, 6in. to 1ft. long in others and varying occasionally but rarely to ovate-lanceolate, more frequently to linear. Scapes longer than the leaves, bearing in the upper portion a rather dense or more or less interrupted spike from 1 to 3 or 4in. long, more or less hirsute, with short or long hairs more appressed than on the leaves; in starved specimens grown in very dry places, the spikes are sometimes reduced to very few or even only 2 or 3 flowers clustered at the end of a short scape. Calyx sessile within a bract rather shorter and narrower than the sepals and not at all or very narrowly scarious on the margins. Sepals all free,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  line

long, obtuse with broad scarious margins, the centre opaque, from copiously hirsute to quite glabrous. Corolla-tube about as long as the calyx, lobes ovate, usually broad, acute or almost obtuse, much imbricate in the bud, one entirely outside and the opposite one entirely inside. Ovules 2-celled with 2 collateral ovules in each cell. Capsule shortly conical at the top or obtuse, circumciss, ripening all 4 seeds or sometimes only 1 or 2 of them.—Dene. in DC. Prod. xiii. i. 701; Nees in Pl. Preiss. i. 490; Hook. f Fl. Tasm. i. 302; *P. debilis*, Nees in Pl. Preiss. i. 491, not of R. Br.

Hab.: In the interior, *Mitchell*; a most abundant plant.  
The variations of this polymorphous species are so complicated that I have been unable to assign them any definite limits as to characters or to geographical range, and it would appear that no less than ten of the supposed species enumerated by Decaisne should be included in it, the characters derived from supposed duration, from minutæ in the form and hairiness of the sepals and bracts, and from the breadth and acuteness of the corolla-lobes having entirely broken down. The typical *P. varia* has the woolly hairs at the base of the leaves copious, the sepals not very obtuse and hispid on the opaque centre and extends over the whole range of the species.—*Benth.*

ORDER XCVIII. NYCTAGINÆ.

Perianth simple, inferior, the lower portion persistent and enclosing the ovary and fruit, the upper portion variously shaped, with 5 rarely 4 angles folds teeth or lobes, deciduous or withering. Stamens either of the same number as the folds or teeth of the perianth or fewer or more, often inconstant in the same species, and never more than 20, inserted on (or united at the base with) a narrow or cupshaped disk more or less adnate to the stipes of the ovary within the perianth (or rarely free from the base?); filaments slender, usually exserted; anthers 2-celled, the cells attached back to back and opening longitudinally round the outer margin. Ovary shortly stipitate within the base of the perianth, 1-celled, with 1 erect anatropous ovule. Style terminal, simple, undivided, with a single stigma. Fruit 1-seeded, enclosed in the persistent tough or hardened base of the perianth which falls off with it having the appearance of a pericarp, the real pericarp thin and membranous more or less adherent to and often inseparable from the equally thin testa of the seed. Embryo curved transversely folded or longitudinally convolute around or within a mealy albumen, radicle inferior.—Herbs, shrubs or trees, the nodes often tumid and articulate. Leaves usually opposite, often unequal in each pair, rarely alternate, usually entire or scarcely sinuate. Flowers solitary clustered or umbellate, the bracts in many genera not Australian forming an involucre round them sometimes large and coloured, but often small, and in the Australian genera the bracts all very small and deciduous.

A small Order of which the genera are all American, and exclusively so with the exception of the two found in Australia, which are both of them widely dispersed over the tropical and subtropical regions of both the New and the Old World. The third is an introduction.

TRIBE I. **Mirabilieæ.** *Embryo hooked, radicle long.*

Perianth elongate, rarely campanulate, the involucre not changed after flowering 1. \**Mirabilis*.  
Upper portion of perianth deciduous. No involucre . . . . . 2. *Boerhaavia*.

TRIBE II. **Pisonieæ.**—*Embryo straight, radicle short.*

Limb of perianth persistent on the fruit . . . . . 3. *Pisonia*.

1. \*MIRABILIS, Linn.

(Name from the Latin, signifying something wonderful or admirable.)

Flowers regular, hermaphrodite. Calyx petaloid-tubular or tubular-infundibuliform. Limb usually patulous, 5-dentate, membranous-dilated between the teeth and induplicate-contorted in the bud; tube slightly dilated at the base and

somewhat constricted above dilatation, upper part caducous. Stamens 5, unequal, even with or slightly longer than tube of perianth, alternating with its teeth; filaments 1-delphous at base, sometimes connate in a short, thick, fleshy, disk-like tube, free above; anthers short, 2-celled, laterally or subintrorsely rimose at margins. Ovary free above, surrounded at the base by a thin disk, 1-celled; style slender, recurved at apex; summit globose, divided into short, simple or slightly ramose, capitellate, stigmatiferous branches; ovule 1, sub-basilar, suberect, inserted in internal angle of the ovary, anatropous or sub-campylotropous; micropyle anterior, inferior. Fruit (an achene or nearly a caryopsis) clothed with hardened 5-agonal base of the calyx and base of stamens; internal albumen of suberect seed farinaceous; cotyledons of incurvo-involute peripheral embryo incumbent, unequal (the interior smaller); radicle cylindro-conical, inferior.—Herbs. Roots usually tuberous-conical, stem and branches articulate at nodes; leaves simple, opposite, exstipulate; flowers crowded in cymes at ends of twigs (sometime 1-parous); involucre (sometimes calyciform) formed of five large bracts connate at base, imbricate or subvalvate, 1-flowered in *Eunirabilis*. Flowers articulate at base beyond involucre.—*Baillons*, Nat. Hist. of Plants iv. 18.

1. **M. jalapa** (so named from its being at one time supposed to furnish the jalap of commerce), *Linn*; *Choisy in DC. Prod.* xiii. 2427. Marvel of Peru or Four-o'clock. Stems thick, subglabrous, dichotomously branched, arising annually from a thick tuberous rootstock. Leaves opposite, ovate, acute, petiolate. Flowers terminal, 3 to 6 together, red, white, yellow, or variegated, each enclosed in a calyx-like involucre with 5 long lanceolate teeth, a cylindrical perianth-tube 1 to 1½ in. long, a spreading limb, 1 in. broad, with 5 round lobes, 5 stamens incurved at the tip with minute anthers, and an obovoid or sub-globose black 10-ribbed fruit, surrounded by the indurated base of the perianth.

Hab.: This tropical American plant has become naturalised near settlements in several parts of Queensland.

The juice of the leaves is applied to wounds and bruises; boiled in water they are used as a stimulating poultice to boils and buboes; the roots possess purgative properties; the seeds are used to adulterate black pepper in India, according to Dr. Dymock. Although these seeds could be obtained in quantity in Queensland they are not likely to be applied for the latter purpose while grocers can obtain linseed meal.

## 2. BOERHAAVIA, Linn.

(After Hermann Boerhaave.)

Flowers hermaphrodite. Upper portion of the perianth campanulate or funnel-shaped, truncate or plicate or very shortly 5-lobed, falling off after flowering, leaving the lower portion persistent and enclosing the ovary and fruit. Stamens 1 to 4, usually exserted. Stigma dilated peltate or oblique. Fruit completely enclosed in the somewhat hardened 5-ribbed base of the perianth. Embryo transversely folded at the base of the cotyledons.—Herbs usually perennial. Leave opposite. Flowers small, in little clusters or umbels on simple or branched axillary peduncles. Bracts and bracteoles very small.

The genus is widely diffused over the tropical and subtropical regions of the New and the Old World. The Australian species are both Asiatic, one a common weed in Africa and Asia, the other perhaps confined to Asia; both, however, require further comparison with some of the American species.

Leaves orbicular or ovate to narrow-lanceolate. Deciduous portion of the perianth campanulate, not exceeding 1 line . . . . . 1. *B. diffusa*.  
Leaves cordate-ovate to lanceolate. Deciduous portion of the perianth 3 to 4 lines long, funnel-shaped, with a narrow tube . . . . . 2. *B. repanda*.

1. **B. diffusa** (diffuse), *Linn. Choisy in DC. Prod.* xiii. ii. 452; *Benth. Fl. Austr.* v. 277. "Koo-jo," Cloncurry, *Roth*; "Goitcho," *Palmer*. A perennial with procumbent diffuse or ascending stems extending sometimes to several feet,

the whole plant glabrous, or the lower portion and foliage pubescent or hirsute, with a few longer articulate hairs and sometimes glandular-viscid. Leaves of each pair unequal or nearly equal, petiolate, the lower ones often broadly ovate or orbicular  $\frac{1}{4}$  to 1 in. diameter, the upper ones usually smaller or narrower, sometimes nearly all narrow-lanceolate, from very obtuse to acute, entire sinuate or crisped on the margins especially when hirsute, the smaller ones sometimes clustered in the axils, the floral ones passing into minute bracts. Flowers very small, pale pink, sessile or on very short pedicels somewhat lengthened under the fruits, in little heads or umbels on filiform peduncles more or less branched into compound umbels or irregular panicles axillary or terminal. Bracts under the pedicels small and lanceolate, with a pair of minute bracteoles under the perianth. Perianth constricted above the ovary, the lower portion about  $\frac{1}{3}$  line long, rather thick, 5-ribbed, studded with stipitate glands, the upper deciduous portion campanulate, petal-like, scarcely lobed, from  $\frac{3}{4}$  to rather above 1 line long. Stamens usually 3, sometimes 1, 2 or 4, inserted in a narrow cup-shaped toothed disk adnate to the stipes of the ovary, which as well as the whole ovary is entirely enclosed in the base of the perianth; filaments as long as or rather longer than the perianth. Fruiting base of the perianth oblong-turbinate, glandular-muricate when dry, becoming enveloped in mucilage in hot water, from 1 to nearly 2 lines long.—*B. mutabilis*, Br. Prod. 422, Choix. in DC. Prod. xiii. ii. 455 (there placed in a wrong division); Nees in Pl. Preiss. i. 622; F. v. M. Pl. Vict. ii. t. 67 (the insertion of the stamens and style incorrect); *B. pubescens*, R. Br. Prod. 422; *B. procumbens*, Roxb.; Wight, Ic. t. 874.

Hab.: Common throughout the colony.

The glabrous and hirsute states are generally found in the same localities, the former, however, by far the most frequent. The species is a common weed in the warmer regions of Asia and Africa.

Roots roasted whole and eaten, of a mealy sweetish taste, and very nourishing.—Palmer.

**2. *B. repanda*** (repand), Willd.; Choix. in DC. Prod. xiii. ii. 455; Benth. Fl. Austr. v. 278. A stouter and coarser plant than *B. diffusa*, usually glabrous and spreading. Leaves petiolate, cordate-ovate or lanceolate, usually acuminate, the margins undulate, rather thick, often above 1 in. long, but sometimes small. Flowers pedicellate in umbels on axillary or terminal peduncles and very frequently with a whorl of 6 to 8 pedicellate flowers at some distance from the terminal umbel. Pedicels 2 to 6 lines long, or more usually unequal in the same umbel, not so slender as in *B. diffusa*. Lower portion of the perianth under 1 line long, glandular muricate as in *B. diffusa*, upper deciduous portion funnel-shaped, 3 to 4 lines long, the slender part of the tube as long as the campanulate summit. Stamens usually 2 or 3, sometimes 4, exerted. Fruit considerably longer than in *B. diffusa*.—Wight, Ic. t. 1766.

Hab.: Lady Elliott's Island, Capt. Robertson.

The species has a considerable range in E. India, the Indian Archipelago, &c., chiefly in maritime districts.

### 3. *PISONIA*, Linn.

(After M. Piso.)

Flowers hermaphrodite or unisexual. Perianth in the hermaphrodite flowers contracted above the ovary, in the males campanulate, in the females ovoid or cylindrical, the margin in all 5-angled or 5-toothed. Stamens usually 6 to 8, longer than the perianth, none in the female flowers. Ovary entirely wanting or imperfect in the male flowers. Stigma in the females dilated, oblique. Fruiting perianth oblong or elongated, 5-ribbed, smooth or glandular-muricate, crowned by the small withered limb of the perianth. Seed oblong with a deep

longitudinal furrow. Albumen scanty. Embryo straight, the cotyledons convolute over the intruded testa.—Tree shrubs or woody climbers. Leaves opposite or scattered. Flowers in dense or loose cymes, often arranged in terminal panicles. Bracts and bracteoles very small or none.

The species are numerous in tropical and subtropical America, but there are also a few in southern Asia and in the island region from the S. African coast to the Pacific. Of the three Australian species one is widely spread over the tropical regions both of the New and the Old World, another extends to Norfolk Island and New Zealand, and possibly to some of the islands of the Eastern Archipelago and South Pacific, the third may be endemic, but closely resembles if it be not identical with a Pacific island species, the synonymy, however, notwithstanding the researches of Seemann, remains exceedingly confused, and the specimens now in the herbaria are wholly insufficient to clear it up.—*Benth.*

Tall woody climber with axillary spines. Flowers unisexual. Fruiting

perianth muricate . . . . . 1. *P. aculeata*.

Unarmed trees.

Flowers unisexual. Perianth shortly villous, muricate when in fruit . . . 2. *P. inermis*.

Flowers (all?) hermaphrodite. Perianth glabrous, elongated and smooth or minutely papillose-scabrous when in fruit. . . . . 3. *P. Brunoniana*.

1. ***P. aculeata*** (prickly), *Linn*; *Chois. in DC. Prod.* xiii. ii. 440; *Benth. Fl. Austr.* v. 279. A tall woody climber, forming impenetrable masses on the borders of forests, reduced to a low straggling bush in open places, glabrous or rarely pubescent, often armed with stout recurved axillary prickles (abortive peduncles). Leaves opposite or here and there alternate, petiolate, ovate, often broad, or rarely oblong or lanceolate, obtuse, entire, rarely exceeding 3in. and often all under 2in. long. Flowers diœcious, in small dense cymes or globular clusters, of which several are usually collected into small panicles in the upper axils, the common peduncles rarely exceeding the leaves and often very short. Male perianths shortly pedicellate, campanulate, shortly and broadly 5-toothed, the bud clavate and prominently 5-angled at the top, opening to about 2 lines diameter. Female perianths nearly sessile, ovoid, about 1 line long, obscurely 5-toothed, enclosing the ovary, the style shortly protruding, with a deeply lobed or fringed stigma. Fruits in loose cymes forming often large panicles, the pedicels lengthening to above  $\frac{1}{2}$ in., the enlarged perianth oblong or linear-clavate,  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long, 5-ribbed, glandular-muricate.—*Wight, Ic. t.* 1763, 1764; *P. villosa*, *Poir.*; *Chois. in DC. Prod.* xiii. ii. 440; *P. limonella*, *Blume*; *Chois. Ic.* 446.

Hab.: Cape York, *Daemel*; Burdekin River, *Fitzalan*; Edgecombe and Rockingham Bays, *Dallachy*; Broadsound and Nerkool Creek, *Bowman*; Rockhampton, *O'Shanesy*.

The species is very widely distributed over the tropical regions of the New and the Old World, especially in maritime districts.

Wood light-coloured, close-grained, and very tough.—*Bailey's Cat. Ql. Woods*, No. 303a.

2. ***P. inermis*** (unarmed), *Forst. Prod.* 75; *Benth. Fl. Austr.* v. 280. A tall tree, glabrous except the inflorescence. Leaves petiolate, ovate or oblong, acuminate or almost obtuse, rounded or narrowed at the base, often 6 to 8in. long. Flowers diœcious, small, collected in small cymes forming a terminal corymbose rather compact panicle, usually shortly pedunculate and much shorter than the leaves. Perianths both male and female narrow, ovoid-oblong, scarcely 2 lines long at time of flowering the males rather longer and more dilated at the orifice than the females, all pubescent or villous. Stamens shortly exerted. Style scarcely protruding from the females. Fruiting perianths in a loose panicle on more or less elongated pedicels, the perianth about  $\frac{1}{2}$ in. long, very prominently muricate along the angles.—*P. grandis*, *R. Br. Prod.* 422; *Chois. in DC. Prod.* xiii. ii. 441; *Endl. Inconogr. t.* 30.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Northumberland Islands, *R. Brown*; Rockingham Bay, *Dallachy*.

The species is also in the Pacific islands.

3. **P. Brunoniana** (after Dr. R. Brown), *Enull. Prod. Fl. Norf.* 43, but not of Choisy.; *Benth. Fl. Austr.* v. 280. A tree attaining sometimes a great height, quite glabrous or the inflorescence minutely pubescent, but never so much so as in *P. incermis*. Leaves mostly opposite, the upper ones sometimes irregularly alternate or approximate so as to appear verticillate, petiolate, from broadly ovate to obovate elliptical or almost oblong, obtuse, contracted or rarely rounded at the base, often 8 in. long or even more but sometimes not half that size, somewhat coriaceous when old. Flowers mostly hermaphrodite, although the ovary in some individuals and stamens in others may be imperfect or less perfect, all shortly pedicellate in small cymes collected into terminal leafless panicles. Perianth when fully out usually about 3 lines long, funnel-shaped, the tube distinctly contracted above the ovary when that is perfect, scarcely so when it is more or less abortive, expanded and obscurely lobed at the top. Stamens usually shortly exerted. Fruiting perianth narrow and above 1 in. long, more or less 5-angled, glabrous and smooth or the angles slightly papillose or tubercular, contracted upwards into a narrow neck crowned by the withered border of the perianth.—Hook. f. *Handb. N. Zeal. Fl.* 229; *P. Sinclairii*, Hook. f. *Fl. N. Zeal.* i. 209, t. 50; *P. Mooriana*, F. v. M. *Fragm.* i. 20.

Hab.: Rockingham Bay, *Dallachy*, and many other tropical localities. The species is also in Norfolk Islands and New Zealand.

Wood soft and light, also of light colour.—*Bailey's Cat. Ql. Woods*, No. 304.

## ORDER XCIX. ILLECEBRACEÆ.

Sepals 4 to 5, persistent, closing over the fruit. Petals minute or none. Stamens hypogynous or perigynous; filaments short; anthers didymous. Ovary free, 1-celled, style 2 to 3-fid, stigmas decurrent; ovule 1, erect or pendulous from a basal funicle. Utricle enclosed in the perianth. Seed globose lenticular or reniform, testa smooth, albumen floury; embryo straight curved or annular.—Herbs, usually small and tufted. Leaves opposite or alternate. Stipules scarious. Flowers cymose, minute.

Plants inhabiting warm dry regions.

TRIBE I. **Pollichieæ**.—Flowers all similar, bracts scarious involucrate at the base. Ovary 1 to 4-ovulate. Embryo dorsal, straight or slightly curved, radicle inferior.

Perianth segments to 3 unguiculate, corky, gibbose thick on the back . . . 1. *Dysphania*.

TRIBE II. **Scleranthææ**.—Flowers all similar. Ovary 1 to 2-ovulate. Embryo annular. Leaves opposite, connate at the base. Stipules none.

Perianth 4 to 5-fid. Stamens perigynous. Ovary 1-ovulate . . . 2. *Scleranthus*.

### 1. DYSPHANIA, R. Br.

(Referring to the minute flowers).

Flowers polygamous. Perianth of 1 to 3 minute segments, which when in fruit are clavate, concave or hood-shaped, white and almost transparent. Stamens 1 to 3. Ovary ovoid; styles 1 or 2, very finely filiform. Fruit ovoid, the pericarp inseparable from the seed. Seed erect, testa crustaceous with a very thin membranous inner integument. Embryo circular enclosing a mealy albumen; radicle inferior.—Small annuals. Leaves alternate, flat, entire. Flowers minute, in clusters either all axillary or in terminal spikes, the females numerous, the hermaphrodite ones few in each cluster.

The genus is limited to Australia. It is nearly allied to the section *Orthosporum* of *Chenopodium*, but readily distinguished by the remarkable perianth.

Fruiting perianth of 3 (rarely 2) segments falling off with the fruit. Style 1.

Plant of 1 to 3 in.

Flower-clusters closely contiguous but axillary, forming a leafy spike . . . 1. *D. littoralis*.

Fruiting perianth usually of a single segment. Styles 2. Plant of 3 to

6 in. Flower-clusters all axillary and distinct . . . 2. *D. myriocephala*.

1. **D. littoralis** (of the coast), *R. Br. Prod.* 411; *Benth. Fl. Austr.* v. 164. A small plant apparently annual, although sometimes hard and perhaps fleshy at the base, with ascending branching stems of 2 to 3 in., glabrous or nearly so. Leaves all petiolate, ovate or oblong, obtuse, entire, rather thick and sometimes fleshy, not above 2 lines long. Flower-clusters all axillary, but nearly all close together, forming a terminal leafy spike occupying the greater part of the plant, the lower clusters sometimes rather more distant. Flowers numerous in the cluster, chiefly females. Perianth of 3 or rarely 2 segments falling off together and enclosing the fruit, the segments all equal, obovate, clavate, concave, contracted at the base, about  $\frac{1}{4}$  line long. Fruit still shorter, obovoid, somewhat oblique; style 1 very finely filiform and very deciduous. Stamens 1 or 2, but difficult to find, and anthers falling off early from the very minute flowers. Seeds shiny.

Hab.: Comet River, *P. O'Shanesy*; Keppel Bay and Mackay, *A. Dietrich*, (*F. v. M.*).

2. **D. myriocephala** (flower-heads numerous), *Benth. Fl. Austr.* v. 165. A diffuse or procumbent glabrous or slightly glandular pubescent annual, much longer than the preceding species, although the ascending branching stems rarely exceed 6 inches. Leaves petiolate, oblong or lanceolate, obtuse, or scarcely acute, rarely above  $\frac{1}{4}$  in. long. Flower-clusters all axillary and distinct, very numerous, occupying the greater part of the plant, globular and scarcely exceeding 1 line in diameter when in fruit, and often much smaller, although containing 10 to 20 or even more flowers, chiefly females, with a very few hermaphrodite or male ones. Segments of the fruiting perianth single and falling off separately about  $\frac{1}{4}$  line long, obovoid-clavate and as it were inflated, shortly contracted at the base. Seed ovoid like that of *D. littoralis*, but more regular and slightly flattened; styles 2, very fine, but shorter than the single one in *D. littoralis*. Stamens 1 or 2, with very short broad filaments and comparatively large anthers.—*D. littoralis*, Moq. in *D.C. Prod.* xiii. ii. 86, not of *R. Br.*

Hab.: Mantuan Downs.

## 2. SCLERANTHUS, Linn.

(From *skleros*, hard, and *anthos*, a flower.)

(*Mniarum*, *Forst.*)

Perianth-tube as long as the lobes, somewhat enlarged and hardened after flowering. Stamens 5 or fewer, opposite the lobes, connected by a membrane or raised line at the mouth of the perianth-tube, with or without intervening teeth or filaments, or in species not Australian perfect stamens. Styles 2, slender. Fruit a membranous utricle enclosed in the perianth-tube.—Small densely branched herbs. Leaves opposite, narrow, connected by a raised line or sheathing membrane, without stipules. Flowers solitary or several together, sessile or nearly so within a pair of scarious bracts at the end of the axillary peduncles.

The genus is represented by a few species in Europe, temperate and subtropical Asia and northern Africa.

1. **S. biflorus** (two-flowered), *Hook. f. Fl. N. Zeal.* i. 74 and *Fl. Tas.* i. 42; *Benth. Fl. Austr.* v. 259. A low tufted perennial, with short decumbent stems forming dense masses of a few inches diameter or rarely looser and lengthening to 6 in., glabrous or with a minute pubescence on the branches. Leaves crowded, narrow-linear, acute, entire or minutely scabrous, serrulate, mostly 3 to 4 lines long. Peduncles axillary, at first very short and sometimes remaining so, but more frequently lengthening before or after flowering and exceeding the leaves when in fruit, each bearing 2 small flowers sessile within a pair of ovate acute concave bracts, and one of the flowers (the latest in expanding) with a pair of smaller bracteoles. Perianth when in flower  $\frac{1}{2}$  to  $\frac{3}{4}$  line long, with 4 or 5 herbaceous



lobes and a single stamen opposite one of the lobes inserted in a scarcely prominent annular membrane at the mouth of the tube. Fruiting perianth nearly one line long, the hardened tube ovoid, almost closed by the staminal membrane, crowned by the unenlarged persistent lobes and enclosing the membranous utricle.—F. v. M. Pl. Vict. i. 214, *Ditoca muscosa*, Banks in Gærtn. Fr. ii. 196, t. 126; *Mniarum biflorum*, Forst. Gen. 2, t. 1; R. Br. Prod. 412; DC. Prod. iii. 378; *M. pedunculatum*, Labill. Pl. Nov. Holl. i. 8, t. 2.

Hab.: Stanthorpe.

## ORDER C. AMARANTACEÆ.

Perianth-segments 5, free or shortly united at the base, rigid and scarious or coloured at least on the margins and tips, imbricate in the bud. Stamens 5 or fewer, opposite the perianth segments, free or united at the base, with or without intervening scales or teeth (staminodia of some authors); anthers 1- or 2-celled, the cells parallel. Ovary 1-celled, with 1 or several ovules attached to a filiform funicle erect from the base of the cavity. Style simple and entire, with a capitate stigma or more or less divided into 2 or 3 branches or separate styles, stigmatic at the end or along the inner edge. Fruit a membranous indehiscent utricle or rarely a circumsciss capsule or a succulent berry, enclosed in or resting on the persistent perianth. Seed usually vertical, orbicular or ovate and compressed, testa crustaceous. Embryo horse-shoe shaped or annular, enclosing a mealy albumen.—Herbs or undershrubs rarely shrubs or woody climbers. Leaves alternate or opposite, entire, without stipules. Flowers rarely solitary in the axils, more frequently in axillary or terminal simple or paniculate spikes or rarely cymes or clusters, each flower sessile or rarely pedicellate, within 2 scarious bracteoles, and subtended by a scarious bract or rarely by a floral leaf.

A considerable Order, spread over the temperate and warmer regions of both the New and the Old World, disappearing in high latitudes and in alpine districts.

TRIBE I. **Celosieæ**.—*Anthers 2-celled. Ovary with several ovules. Leaves alternate.*

Herbs. Fruit membranous . . . . . 1. CELOSIA.  
Woody climbers. Fruit succulent . . . . . 2. DEERINGIA.

TRIBE II. **Amaranteæ**.—*Anthers 2-celled. Ovary with a single ovule.*

Leaves alternate.

Stamens free. Flowers in axillary or terminal and paniculate cymes or clusters. Leaves flat . . . . . 3. AMARANTUS.

Stamens shortly united at the base. Flowers in dense single terminal spikes, often shortened into heads.

Perianth-segments with the whole lamina scarious, coloured and glabrous . . . . . 4. PTILOTUS.

Perianth-segments with the laminae more or less plumose with dorsal articulate hairs, the tips alone glabrous . . . . . 5. TRICHINIUM.

Leaves opposite. Flowers 1 or 2 perfect surrounded by deformed ones.

Stamens with interposed staminodes . . . . . 6. CYATHULA.

Leaves opposite. Stamens united in a cup at the base, with truncate teeth or lobes between the filaments.

Flowers 5-merous, in terminal elongated spikes. Bracts and perianth-segments acute . . . . . 7. ACHRYRANTHES.

Flowers 4-merous, in axillary or terminal spikes shortened into heads.

Bracts and perianth-segments spinescent . . . . . 8. NYSSANTHES.

TRIBE III. **Gomphreneæ**.—*Anthers 1-celled. Ovary with a single ovule suspended from the apex by an elongated funicle. Leaves opposite.*

Stigma capitate. Spikes often shortened into heads, axillary (rarely also terminal) . . . . . 9. ALTERNANTHERA.

Stigma 2-lobed. Spikes often shortened into heads, terminal or rarely axillary . . . . . 10. GOMPHRENA.

## 1. CELOSIA, Linn.

(In reference to the burnt-like appearance of the flowers of some species.)

Flowers hermaphrodite, bracteate also with 2 bracteoles. Perianth scarious, 5-parted, segments oblong or lanceolate, obtuse or acute, striate, the fruit erect. Stamens 5; filaments subulate or filiform, connate in a membranous cup at the base; anthers short or elongated, 2-celled. Ovary ovoid, subglobose, or bottle-shaped. Style none, short or elongated. Ovules 2 or more; funicle elongated: utricle included in the perianth or exserted, ovoid or globose, opening by a rupture across the middle or indehiscent.—Herbs or annuals.

The species are of tropical Asia, Africa and America.

1. **C. argentea** (silvery), Linn. *Moq. in DC. Prod.* xiii. ii. 242. An erect glabrous annual, 1 to 3 or 5 ft. high. Leaves petiolate, from ovate to lanceolate or linear, acuminate, 1 to 6 in. long, green on both sides. Spikes few or many, cylindrical 1 to 8 in. long and about 1 in. broad; peduncles slender. Perianth-segments white and scarious, lanceolate, about 4 lines long, bracts similar but smaller.—Wight Ic. 1767.

Var. *cristata*, Rheede Hort. Mal. x. t. 38, 39. "Cock's-comb." Spikes more or less dillated at the top or variously branched, and usually on a shorter peduncle. Flowers often smaller, and many of them barren.—*C. cristata*, Linn.; *C. cernua*, Roxb.; Wight, Ic. 730; *C. pyramidalis*, Burm. Fl. Ind. 65, t. 25.

Hab.: The native country of this much cultivated plant is uncertain. Met with as a stray from cultivation.

## 2. DEERINGIA, R. Br.

(After Dr. Charles Deering.)

Flowers hermaphrodite or diœcious. Perianth of 5 equal glabrous segments spreading under the fruit. Stamens 5, shortly united in a ring at the base, without intervening staminodia. Anthers 2-celled. Ovary with several ovules. Styles 3 rarely 4, few and stigmatic from the base. Fruit enlarged, succulent, indehiscent. Seeds several.—Tall woody climbers, glabrous or rusty-pubescent. Leaves alternate. Flowers numerous, loosely spicate, the spikes in axillary or terminal panicles. Bracts and bracteoles small, scarious or petal-like.

The genus is widely spread over tropical Asia, more sparingly extending into Africa. Of the two Australian species one is the same as the commonest Asiatic one, the other is endemic.

Quite glabrous. Flowers hermaphrodite . . . . . 1. *D. celosioides*.  
Branches and young leaves pubescent. Flowers diœcious (the ovaries of the  
males without ovules) . . . . . 2. *D. altissima*.

1. **D. celosioides** (*Celosia*-like), R. Br. *Prod.* 413; *Benth. Fl. Austr.* v. 209. A woody glabrous climber scrambling over bushes to the height of 10 or 12 ft. Leaves petiolate, ovate or ovate-lanceolate, acuminate, entire, mostly 2 to 3 in. long. Flowers hermaphrodite, solitary or somewhat clustered, in slender interrupted spikes varying from 2 or 3 to 8 or 10 in. long, either in the upper axils or in a loose terminal panicle, each flower nearly sessile in the axil of a small linear-lanceolate acute bract, shorter than the perianth, except sometimes in the lower part of the spike, and accompanied by two smaller bracteoles. Perianth-segments ovate, scarcely 1 line long, of a greenish white when fresh, black with a whitish margin when dry. Stamens united at the base in a prominent ring or very short cap. Berry red, nearly globular, 3-furrowed, usually about 2 lines diameter or rather larger.—Bot. Mag. t. 2717; Endl. *Iconogr.* t. 62; Wight Ic. Pl. t. 728; *D. baccata*, Moq. in DC. *Prod.* xiii. ii. 236; Rumph. *Herb. Amb.* v, t. 83, f. 2.

Hab.: Shoalwater and Keppel Bays and Broadsound, R. Brown; Endeavour River, A. Cunningham; Barnard Isles, McGillivray; Port Denison, Fitzalan; Rockingham Bay, Dallachy; Rockhampton, Dallachy and others; Darling Downs, Lau; Brisbane River, Moreton Bay, F. v. Mueller and others.

The fungus *Ecidium Deeringiæ*, Cke. and Mass. is found on the leaves of this species.

The species is common in E. India and the Archipelago, extending to New Caledonia and China.

2. **D. altissima** (very tall), *F. v. M. Fragm.* ii. 92, vi. 251; *Benth. Fl. Austr.* v. 210. A woody climber resembling *D. celosioides* but larger, ascending to the tops of the tallest trees, the young parts clothed with a soft rusty crisped pubescence which disappears from the upper surface of the older leaves, persisting underneath or at least leaving some traces along the midrib. Leaves ovate or oblong, rarely ovate-lanceolate, very shortly acuminate, thicker than in *D. celosioides*, and attaining 3 to 6 in. Flowers dioecious, more numerous than in *D. celosioides*, in denser spikes and larger panicles, the males much whiter and more petaloid than in that species, the stamens united in a scarcely prominent ring, the ovary ovoid and conical externally perfect as well as the styles but without any ovules; the female flowers smaller, not so white, in more compact and less branched panicles, the ovary more globular with about 10 to 15 ovules, the stamens more or less imperfect or altogether abortive. Berry globular, red, scarcely  $1\frac{1}{2}$  line diameter.—*Lagrevia altissima*, Moq. in. DC. Prod. xiii. ii. 253; *Lestibudesia asbortsens*, R. Br. Prod. 414; *Celosia arborescens*, Spreng. Syst. i. 815; Moq. in DC. Prod. xiii. ii. 213.

Hab.: Endeavour River, Banks and Solander; Port Denison, Fitzalan; Rockingham and Edgecombe Bays, Dallachy; Brisbane River, Moreton Bay, A. Cunningham and others; Port Mackay, Nernst; or from the Tweed to beyond Rockingham Bay.

The male specimens being the handsomest are the most frequently collected and the only ones seen by R. Brown and by Moquin. The ovary in them is so large that it has not the appearance of being abortive, but I have opened a large number without ever finding any ovules. From its membranous appearance Brown thought the fruit might be capsular, and Moquin that it might be monospermous, which accounts for their not having associated the plant with *Deeringia*.—*Benth.*

### 3. AMARANTUS, Linn.

(Referring to the length of time some of the flowers retain their color).

(*Sarratia*, Moq.; *Amblygyne* and *Euxolus*, Rafin.)

Flowers usually monœcious. Perianth-segments 3 to 5, erect with scarious margins or (especially when in fruit) more or less dilated at the end into spreading scarious laminae. Stamens 3 to 5, free, without intervening staminodia. Anthers 2-celled. Ovary uniovulate. Styles 2 or 3, free and stigmatic from the base. Fruit a membranous utricle, either circumsciss when ripe or indehiscent with the pericarp loose or adnate to the seed. Seed solitary.—Herbs mostly annual, glabrous or nearly so, green or red. Leaves alternate. Flowers small, in dense cymes or clusters, the clusters all axillary or collected in terminal spikes which are either simple or branching into dense panicles. Bracts and bracteoles small, green or scarious. The female flowers are usually much more numerous than the males, which are in the same clusters, chiefly in the upper parts of the inflorescence, with the same number or with fewer perianth-segments than the females.

A considerable Order, spread over the temperate and warmer regions of both the New and the Old World, disappearing in high latitudes and in alpine districts.

The characters derived from the dehiscent or indehiscent pericarp or from the more or less spreading laminae of the fruiting perianth, are so little in accord with habit or with any other character, that I have thought it better to retain the collective genus as a natural and very fairly defined one, than to adopt the purely artificial dissections proposed by Moquin and others.—*Benth.*

#### SECT. I. **Euamarantus**.—*Pericarp circumsciss*.

- |                                                                                                                                                        |                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Plant spiny. Stem smooth, terete . . . . .                                                                                                             | 1. <i>A. *spinosus</i> .     |
| Perianth-segments mostly 5, erect. Tall erect plant with an ample panicle, the points of the bracts very prominent . . . . .                           | 2. <i>A. paniculatus</i> .   |
| Panicles long, narrow, long and drooping. Bracts not exceeding the perianth . . . . .                                                                  | 3. <i>A. *caudatus</i> .     |
| Perianth-segments mostly 4 or 5, erect or slightly dilated at the end. Clusters axillary and in a long loose terminal shortly-branched spike . . . . . | 4. <i>A. leptostachyus</i> . |
| Perianth segments mostly 5, with dilated scarious spreading laminae (when in fruit). Terminal spikes usually paniculate . . . . .                      | 5. <i>A. pallidiflorus</i> . |

SECT. II. **Euxolus**.—*Pericarp membranous, indehiscent or bursting irregularly.*

Pericarp separate from the seed, shorter than or not much longer than the perianth.

Segments of the fruiting perianth 5, with dilated and scarious laminae.

Cymes axillary. Pericarp longitudinally ribbed . . . . . 6. *A. Mitchellii*.

Segments of the fruiting perianth erect or slightly dilated and spreading

Clusters axillary and in a terminal spike.

Fruiting perianths mostly 5-merous . . . . . 7. *A. interruptus*.

Fruiting perianths mostly 3-merous . . . . . 8. *A. viridis*.

Pericarp separate from the seed, oblong, at least twice as long as the perianth. Clusters all axillary . . . . . 9. *A. macrocarpus*.

1. **A. spinosus** (spiny), *Mog. in DC. Pro l. xii. ii. 260*; *Hook. Fl. Brit. Ind. iv. 718*. An erect glabrous annual. Stems 1 to 2ft. high, terete, spiny at the axils, spines straight, 4 to 8 lines long. Leaves on slender long petioles, ovate or oblong, 1 to 4in. long,  $\frac{3}{4}$  to 2in. broad. Flowers in axillary clusters and long dense or lax-fid spikes. Bracts setaceous, equalling or exceeding the sepals. Sepals of the males acuminate, of females obtuse apiculate. Stamens 5; stigmas 2, utricle rugose, long as the sepals, thickened at the top. Seeds black, shining, border obtuse, not thickened. The plant varies in colour from green to red and purple.

Hab.: Met with in various tropical countries. Endeavour River, *Rev. J. E. Tenison-Woods*

2. **A. paniculatus** (paniculate), *Linn*; *Mog. in DC. Prod. xiii. ii. 257*; *Benth. Fl. Austr. v. 213*. An erect stout annual sometimes attaining 5 or 6ft., the foliage and inflorescence often assuming a reddish hue and sometimes the panicle a rich crimson. Leaves on long petioles, ovate or ovate-lanceolate, 2 to 4in. long. Flowers in dense cylindrical spikes, the lower ones axillary, the upper ones forming a dense terminal panicle 6in. to 1ft. long, the central spikes thicker and longer than the lateral ones, all appearing more or less echinate by the fine points of the bracts and bracteoles which usually exceed the perianth. Perianth-segments mostly 5, erect, tapering into a fine point, 1 to 1½ line long. Pericarp membranous, rugose, circumsciss. Styles 2 or 3.—*A. frumentaceus*, *Roxb. Fl. Ind. iii. 699*; *Wight, Ic. t. 720*.

Hab.: A very abundant weed and I think indigenous.

3. **A. caudatus** (tailed), *Linn*; *Hook. Fl. Brit. Ind. iv. 719*. A tall robust plant with a striated stem. Leaves long, petiolate, elliptic or ovate-lanceolate, tip obtuse. Panicle a dense soft thyrses hardly squarrose, centre one and often the lateral usually very long and pendulous. Bracts aricular longer than the obovate mucronate sepals.

Hab.: Wild or cultivated in many hot countries. Met with as a stray from cultivation.

4. **A. leptostachyus** (slender spikes), *Benth. Fl. Austr. v. 214*. An erect annual from under 1ft. to about 1½ft. high. Leaves on rather long petioles, ovate, obtuse, under 1in. long, with the primary veins often remarkably prominent. Clusters of flowers rather loose, very numerous, the lower ones axillary, the upper ones forming a long terminal interrupted spike, leafy at the base only like that of *A. interruptus*. Perianth-segments usually 4 or 5, erect or scarcely spreading and persistent with the lower portion of the circumsciss pericarp.

Hab.: Islands off Cape Flattery, *M'Gillivray*.

5. **A. pallidiflorus** (flowers pale), *F. v. M. Fragm. i. 140*; *Benth. Fl. Austr. v. 214*. An erect or decumbent annual of 1 to 2ft. Leaves on long petioles, ovate, obtuse, 1 to 3in. long, rather thin and of a pale green. Lower cymes or clusters of flowers axillary, the upper ones in dense spikes forming a terminal

panicle of  $\frac{1}{2}$  ft. or more, the central spike very long, the lateral ones short. Bracts and bracteoles scarious lanceolate or ovate-lanceolate, very acute, about as long as the claws of the perianth-segments or rarely as long as the whole perianth. Perianth-segments 5, lanceolate at the time of flowering, those of the female when in fruit with broad erect claws of about  $\frac{1}{2}$  line and expanded into broadly ovate mucronate-acute spreading and scarious laminae, rather longer than the claws. Pericarp very rugose, membranous, circumscess, with a thick apex and three fine styles.

Hab.: Flinders River, *C. F. Plant*; Mount Perry, *J. Keys*.

6. **A. Mitchellii** (after Sir T. Mitchell), *Benth. Fl. Austr.* v. 214. Erect, rather stout and rigid, branching but not tall. Leaves on long petioles, ovate-lanceolate oblong, obtuse, narrowed at the base, 1 to 2 in. long. Flowers all axillary and numerous, in sessile or shortly pedunculate cymes often  $\frac{1}{2}$  in. broad, rarely reduced to close clusters. Bracts scarious, nearly as long as the perianth, with a prominent midrib ending in a sharp point, the bracteoles similar but rather smaller. Segments of the fruiting perianth 5, with a rigid erect stipes of about  $\frac{1}{2}$  line, and a broad scarious spreading lamina at least as long, the midrib produced into a rigid point. Perianth globular, membranous, with 12 to 15 prominent undulate longitudinal ribs, indehiscent or bursting irregularly, with a thick summit projecting beyond the perianth, and 3 short subulate stigmatic styles.—*A. undulatus*, Lindl. in Mitch. Trop. Austr. 102, not of R. Br.

Hab.: Narran River, *Mitchell*; Flinders River, *Sutherland*; Charlesville, *Giles*; Armadilla, *W. Barton*; Gordon Downs, *A. Weld-Blundell*; Darr River, *C. W. de Burgh-Birch*; Cooper's Creek, *Neilson*; and many other localities.

Used as a vegetable, *Sutherland*, *Giles*.

7. **A. interruptus** (interrupted), *R. Br. Prod.* 414; *Benth. Fl. Austr.* v. 215. Erect or decumbent, from 6 in. to nearly 2 ft. high. Leaves petiolate, ovate or almost rhomboidal, obtuse,  $\frac{1}{2}$  in. to near 2 in. long. Cymes or clusters dense or at length rather loose, the lower ones axillary, the upper ones forming a long loose spike leafy at the base, either simple or rarely with a few short branches. Bracts and bracteoles shorter than the perianth or about as long, scarcely pointed. Segments of the fruiting perianth 5, narrow, erect, slightly spatulate, shortly but finely pointed, about  $\frac{3}{4}$  line long, white and scarious on the margins, dark in the centre, those of the male flowers usually 3 only and not dilated upwards. Pericarp membranous, rugose, not ribbed, indehiscent or bursting irregularly, loose over the seed with a short thick summit about as long as the perianth. Styles 2 or rarely 3.—*A. undulatus*, *A. rhombus*, and *A. lineatus*, R. Br. l.c.; *Eurulus undulatus*, *E. rhombus* and *E. interruptus*, Moq. in DC. Prod. xiii. ii. 272 and 275; *E. lineatus*, Moq. l.c. 276 as to the Australian, but not the Sandwich Island plant.

Hab.: Rockhampton, *O'Shanesky*; Brisbane River, *Leichhardt*; Port Mackay, *Nerst*; a troublesome weed everywhere.

8. **A. viridis** (green), Linn.; *Benth. Fl. Austr.* v. 215. An erect or decumbent annual of 1 to 2 ft. Leaves petiolate, ovate or ovate-lanceolate, obtuse, rather thin but the pinnate veins usually prominent underneath, 1 to 2 in. long. Flowers small, green with an obtuse appearance, the lower ones in small axillary sessile cymes or close clusters, the upper ones in rather loose or interrupted spikes, forming a short terminal panicle, the central spike 1 to 3 in. long, the lateral ones few and short. Bracts and bracteoles narrow, not exceeding the perianth. Perianth-segments 3, narrow, erect, scarcely  $\frac{3}{4}$  line long, falling

off with the fruit. Pericarp rugose, indehiscent, free from the seed, about as long as the perianth. Styles usually 3.—*Eurotus viridis*, Moq. in DC. Prod. xiii. ii. 273.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*; Rockhampton, *Dallachy* and others; Nerkool Creek, *Bowman*; a common troublesome weed.

Common in waste and cultivated places in the warmer regions of Europe, Asia, and Africa, and now frequent in several parts of America.

9. **A. macrocarpus** (long fruit), *Benth. Fl. Austr.* v. 216. A small diffuse or decumbent plant. Leaves on long petioles, obovate or oblong, very obtuse or emarginate, about  $\frac{1}{2}$  in. long or rather more. Flowers in dense axillary sessile nearly globular clusters, chiefly females. Bracts and bracteoles shorter than the perianth. Fruiting perianth of 3 rarely 5 narrow-linear erect very pointed segments sometimes slightly dilated below the point. Fruit oblong or almost bottle-shaped,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  line long, much exceeding the perianth, the pericarp inflated, membranous and reticulate-rugose, drying black in the common form. Seed erect, obovoid, much smaller than the cavity of the fruit.

Hab.: Armadilla, *Barton*; Dawson River, *Leichhardt*; Camowéal, *T. P. Keys*; not uncommon inland.

Var. *pallida*. Fruit of a pale-green when dry. Perianth smaller and often reduced to 1 or 2 segments.—*Curriwillinghamie*, *Dalton*.

#### 4. **PTILOTUS**, R. Br.

(Having featherless wings.)

Flowers hermaphrodite. Perianth-segments 5, linear, free or united in a very short tube at the base, rigid, the lower portion usually 3-ribbed and glabrous, or covered outside with articulate hairs or intricate wool, the upper moiety a glabrous coloured lamina, all glabrous inside, or the inner ones with woolly hairs below the lamina. Stamens 5, one or two of them sometimes small without anthers, all united in a short cup or ring at the base, without intervening teeth or lobes; anthers 2-celled. Ovary uniovulate; style central or slightly excentric. Fruit an indehiscent utricle. Seed vertical.—Herbs mostly (or always?) annual and glabrous except the inflorescence. Flowers in globular conical or cylindrical spikes, with a woolly rhachis. Bracts and bracteoles scarious.

The genus is probably limited to Australia. It only differs from some of the smaller flowered *Trichinia*, in the absence of the dorsal hairs which, in the latter genus, give the laminae of the perianth-segments a plumose appearance.—*Benth*.

Perianths glabrous outside except a few hairs around the base.

Leaves linear.

Spikes globular or scarcely ovate.

Filaments dilated under the anthers . . . . . 1. *P. conicus*.

Filaments filiform except at the base.

Perianth not exceeding 2 lines. Bracts mostly acute and appressed . . . 2. *P. corymbosus*.

Spikes at first conical, at length cylindrical . . . . . 3. *P. spicatus*.

Perianths enveloped in dense white cottony wool proceeding from the lower half. Leaves oblong or obovate.

Spikes sessile, cylindrical. Leaves oblong . . . . . 4. *P. Murrayi*.

Spikes globular. Leaves obovate . . . . . 5. *P. latifolius*.

1. **P. conicus** (conical), *R. Br. Prod.* 415; *Benth. Fl. Austr.* v. 242. An erect glabrous annual, closely resembling *P. corymbosus*, but usually more rigid, 1 to 2 ft. high, with elongated branches. Leaves very narrow-linear as in that species. Spikes few on long peduncles, larger than in *P. corymbosus*, globular and 5 lines diameter, or at length ovoid and 7 or 8 lines long. Bracts narrow, acute or aristate, shorter than the perianth. Perianth-segments all scarious, or the inner ones more rigid and slightly ribbed at the base,  $2\frac{1}{2}$  to nearly 3 lines

long. Filaments much dilated towards the base, and again shortly dilated and obcordate under the anthers.—Moq. in DC. Prod. xiii. ii. 282; *Trichinium conicum*, Spreng. Syst. i. 816.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

2. **P. corymbosus** (corymbose), *R. Br. Prod.* 415; *Benth. Fl. Austr.* v. 242. An erect slender glabrous annual of about 1ft. or rather more, loosely and corymbosely branched at the top or nearly from the base. Leaves very narrow-linear, acute, the lower ones often nearly 2in. long, those of the branches very small. Spikes small, at first hemispherical, at length globular or almost ovoid, glabrous outside. Bracts and bracteoles ovate, scarious, minutely mucronate, much shorter than the perianth. Perianth-segments all equal, about 2 to  $2\frac{1}{2}$  lines long, acute, the two outer ones scarious almost from the base, glabrous inside as well as out, the 3 inner ones more rigid, ribbed, and woolly inside in the lower half or claw. Filaments filiform to the top, slightly dilated to the base and united in a very short cup.—Moq. in DC. Prod. xiii. ii. 282; *Trichinium corymbosum*, Spreng. Syst. i. 816 not of Gaudich.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

3. **P. spicatus** (spicate), *F. v. M. Herb.*; *Benth. Fl. Austr.* v. 243. An erect glabrous annual (or with a perennial rhizome?) of 1 to 2ft., with long branches bearing usually each a single spike as in *P. conicus*. Leaves narrow linear or rarely linear-lanceolate acute, the larger ones 2in. long. Spikes at first shortly conical, at length cylindrical and above 1in. long. Bracts and bracteoles narrow, acute or aristate, shorter than the perianth. Perianth about  $2\frac{1}{2}$  lines long, surrounded at the base by a dense ring of rigid hairs some of which are also on the lower portion or claws of the segments; segments free from the base, the upper half scarious coloured (pink or red), obtuse and quite glabrous, the 3 inner ones woolly inside below the middle. Staminal cup very short, the filaments not very unequal, filiform, scarcely dilated at the base.

Hab.: Camoweal, *T. P. Keys* and *R. C. Burton*; McKinley Range, *R. C. Burton*.

Var. *leianthus*. Claws or lower portion of the perianth-segments without any or scarcely any dorsal hairs.—Gulf of Carpentaria, *Leichhardt*; Flinders River, *Borman*, *Sutherland*.

4. **P. Murrayi** (after —. Murray), *F. v. M. Fragm.* iii. 145; *Benth. Fl. Austr.* v. 243. A small prostrate branching annual (or perennial?). Leaves oblong, obtuse, under  $\frac{1}{2}$ in. long, contracted into a petiole, glabrous as well as the branches. Spikes axillary and terminal, sessile, at first globose, at length oblong or cylindrical and about  $\frac{1}{2}$ in. long and  $2\frac{1}{2}$  to 3 lines diameter, the pink tips of the perianths just appearing above the white wool. Bracts and bracteoles ovate, obtuse, scarious, glabrous, scarcely above  $\frac{1}{2}$  line long. Perianth about  $1\frac{1}{4}$  line long, with a very short turbinate base, the segments thinly scarious with a red centre, glabrous in the upper half, the lower half covered outside with a long dense intricate white wool. Filaments slender, nearly as long as the perianth, united at the base in a truncate ring, slightly prominent from the perianth-tube; anthers all 5 perfect (or one sometimes abortive?). Fruit glabrous; style rather excentric.

Hab.: Monkira, *G. L. Debney*.

5. **P. latifolius** (leaves broad), *R. Br. App. Sturt's Exped.* 25; *Benth. Fl. Austr.* v. 244. Stems erect, much branched, herbaceous (annual? or from a thick rhizome?) attaining 2ft., the branches and young foliage covered with an intricate white cottony wool, the older leaves becoming glabrous. Leaves obovate, very obtuse, rather thick, with slightly crisped margins, contracted into a rather long petiole, the largest leaves described as scarcely 1in. long,

the upper ones much smaller. Spikes nearly globular, fully  $\frac{1}{2}$  in. diameter, numerous, sessile or shortly pedunculate, terminal or in the upper axils, usually with one or two small herbaceous leaves close under them. Bracts and bracteoles thinly scarious, white and shining, very broadly ovate or almost orbicular, obtuse, loose or spreading,  $2\frac{1}{2}$  to 3 lines long. Perianth not 2 lines long, the base a very short open disk, the segments with a narrow base densely clothed outside with long woolly hairs, glabrous inside, the lamina or upper half rather broader obtuse (pink ?) and glabrous. Stamens all perfect and nearly equal in the flowers examined. Ovary glabrous.—F. v. M. *Fragm.* vi. 232.

Hab.: Queensland border of Central Australia, *C. Winnecke's Expedition*, 1883.

### 5. TRICHINIUM, R. Br.

(From *trichinos*, covered with hairs).

(*Goniotriche*, Turcz ; *Hemisteirus* and *Arthrotrichum*, F. v. M.).

Flowers hermaphrodite. Perianth with a short turbinate hard tube, reduced sometimes to a slight expansion of the peduncle ; segments 5, all equal or the three inner ones rather smaller, linear, rigid, usually 3-ribbed at the base, scarious at the tips or also along the margins of the upper portion, covered outside either entirely or rarely along the centre only with straight more or less distinctly articulate (several-celled) hairs giving them a plumose appearance, the short tips alone glabrous. Stamens normally 5, but usually 1, 2, or 3 of them small and without anthers, or entirely abortive, and all the filaments unequal, or more rarely all equal and antheriferous, united at the base in a membranous cup adnate to the perianth-tube or shortly free from it, without or rarely with intervening scale-like teeth or lobes, which when present, are very thin and transparent ; anthers 2-celled. Ovary uniovulate. Style simple, rigid, with a small capitate stigma. Fruit an indehiscent utricle, usually obovoid or contracted into a stipes at the base and oblique at the top, with the persistent style more or less excentric. Seed vertical.—Herbs undershrubs or rarely shrubs, glabrous or hairy with crisped articulate woolly or stellate hairs. Leaves alternate, narrow or rarely obovate. Flowers in dense globular ovoid or cylindrical spikes, very rarely elongated and interrupted. Bracts and bracteoles scarious and shining, nerveless or with a more or less prominent midrib produced into a fine or short point. Perianths usually pink or straw-colour. Stamens and ovary often enveloped in dense wool or long hairs proceeding either from the lower part or claws of the inner perianth-segments or from the outside of the staminal cups.

The genus is limited to Australia.

**SERIES I. *Astrotricha*.**—*Foliage hoary or white with a stellate tomentum (glabrous or with crisped or woolly or silky hairs in all the other series).*

Spikes dense, globular ovoid or shortly cylindrical, not exceeding 1 in.

Spikes  $\frac{1}{2}$  to 1 in. diameter. Laminae of perianth-segments linear.

Leaves mostly broad, rather thick and densely tomentose.

Spikes globular or at length ovoid. Bracts glabrous or nearly so 1. *T. obovatum*.

Leaves mostly narrow, rather thin, less densely tomentose.

Spikes ovoid, at length cylindrical. Bracts glabrous or slightly woolly

2. *T. parviflorum*.

Spikes elongated with distant flowers. Leaves oblong or lanceolate, the stellate hairs short and scattered

3. *T. dissitiflorum*.

**SERIES II. *Straminea*.**—*Spikes cylindrical or elongated or rarely globular, 1 to 2 in. diameter. Flowers more or less yellow or greenish, not red. Inner segments without internal dense wool, but the stamens usually surrounded by a few long hairs.*

Spikes elongated with distant flowers. Leaves filiform

4. *T. distans*.

Spikes dense, at length long and cylindrical.

Leaves linear. Bracts wholly transparent. Bracteoles broad without prominent midribs. Perianth under  $\frac{1}{2}$  in.

5. *T. alopecuroides*.

Leaves obovate or oblong. Bracts opaque in the centre. Bracteoles oblong or lanceolate with prominent keels. Perianth above  $\frac{1}{2}$  in. long.

6. *T. nobile*.



Spikes ovoid or shortly cylindrical, 2in. diameter. Bracts transparent.

Leaves linear . . . . . 7. *T. macrocephalum*.  
 Spikes globular or rarely ovoid. Perianth-segments rather broad, the  
 dorsal hairs very short . . . . . 8. *T. corymbosum*.

SERIES III. **Rhodostachya**.—Spikes globular ovoid or rarely cylindrical, 1 to 2in. diameter, terminating simple or rarely branched stems. Perianth straight, pink or red, the inner segments woolly inside towards the base.

Spikes  $1\frac{1}{2}$  to 2in. diameter.

Perianth-segments very rigid with short narrow tips. Stems erect.

Spikes about  $1\frac{1}{2}$ in. diameter.

Spikes at length elongated and cylindrical . . . . . 9. *T. exaltatum*.

Spikes globular or shorter than broad . . . . . 10. *T. semilanatum*.

SERIES IV. **Polycephala**.—Stems mostly branched or rarely some of them long decumbent and simple, glabrous or with crisped woolly hairs. Spikes mostly globular,  $\frac{3}{4}$  to 1in. diameter.

Inner perianth-segments nearly glabrous inside. Staminal cup surrounded by long straight hairs.

Leaves linear-filiform. Perianth straight. Stamens 3 or 4 perfect the filaments forming at the base a complete cup or ring.

Perennial with a thick rootstock. Spikes about 1in. diameter . . . 12. *T. fusiforme*.

Annual. Spikes about  $\frac{3}{4}$ in. diameter . . . . . 13. *T. gracile*.

SERIES V. **Squamigera**.—Spikes globular or cylindrical,  $\frac{1}{2}$  to 1in. diameter. Staminal cup with transparent scale-like teeth or lobes between the filaments (wanting in all the other series). Leaves narrow.

Annual with slender branching stems of 1ft. or more. Spikes cylindrical

about  $\frac{3}{4}$ in. diameter . . . . . 14. *T. calostachyum*.

SERIES VI. **Parviflora**.—Spikes globular, ovoid or cylindrical,  $\frac{1}{4}$  to  $\frac{1}{2}$ in. diameter.

Perennial. Bracts and bracteoles nearly as long as the perianth and very conspicuous.

Young shoots woolly. Leaves glabrous, broad. Spikes ovoid. Per-

ianth-segments glabrous inside . . . . . 15. *T. aevroides*.

1. **T. obovatum** (obovate), *Gaudich. in Freyc. Voy. Bot.* 445 t. 49; *Benth. Fl. Austr.* v. 220. An erect undershrub, from under 1ft. to 3 or even 4ft. high, paniculately branched sometimes from the base sometimes at the top only, clothed with a soft dense stellate tomentum, intermixed occasionally with long denticulate hairs. Leaves obovate or oblong, very obtuse or rarely mucronate-acute, contracted into a petiole rather long in the lower leaves, short in the upper ones, the larger ones attaining 2in. but mostly under 1in. long. Spikes nearly globular or scarcely ovoid,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. diameter, sessile or shortly pedunculate, in terminal corymbose panicles, which are sometimes compact and leafless, sometimes more spreading and leafy at the base. Bracts and bracteoles usually rather brown, obtuse or shortly mucronate-acute, glabrous or nearly so, under 2 lines long. Perianth 3 to 4 lines in the typical form, the tube about  $\frac{1}{4}$  line, segments rigid, plumose with long white hairs, the glabrous tips short obtuse and denticulate in the outer segments, the inner ones shorter and more acute, glabrous inside. Stamens unequal, 3 or 4 perfect, filaments dilated downwards, scarcely united above the perianth-tube, surrounded by a ring of long articulate hairs. Ovary usually hairy on the top. Style excentrical.—*Moq. in DC. Prod.* xiii. ii. 286; *Ptilotus obovatus*, F. v. M. *Fragm.* vi. 228; *Key Sys.* V. Pl. Fig. 35; *T. incanum*, *Moq. l.c.* 285 not of R. Br.; *T. sessilifolium*, *Lindl. in Mitch.* Three Exped. ii. 13; *Moq. l.c.* 284; *T. lanatum*, *Lindl. in Mitch.* Three Exped. ii. 123; *Moq. l.c.* 285; *Ptilotus Lindleyi*, F. v. M. *Fragm.* vi. 233 (from the synonym); *P. atriplicifolium*, A. Cunn. in *Moq. l.c.* 286, *T. variabile*, F. v. M. in *Linneæ* xxv. 436; *Gomotriche tomentosa*, *Turez. in Bull. Soc. Imp. Nat. Mosq.*, 1849, 37 (corrected to *Goniotriche*, l.c. 1852, ii. 181).

Hab.: Narrau River, *Mitchell*. Common on the inland downs.

2. **T. parviflorum** (flowers small), *Lindl. in Mitch. Three Exped.* ii. 13; *Benth. Fl. Austr.* v. 222. A perennial or undershrub with a thick woody stock and erect branching stems, hoary as well as the foliage with a stellate tomentum, closely allied to *T. obovatum*. Lower leaves sometimes obovate, but mostly lanceolate or almost linear, obtuse, thinner than in those two species, the stellate tomentum disappearing with age on the upper surface, and not very dense on the lower. Spikes at first short, but lengthening out to about 1 in. and about  $\frac{1}{2}$  in. diameter, sessile or shortly pedunculate in a loose divaricate panicle. Bracts and bracteoles thin and transparent, 1 to  $1\frac{1}{2}$  line long, slightly woolly. Perianth about 3 lines long, the tube about  $\frac{1}{4}$  line long, hirsute, the segments plumose. Stamens 3 or 4 perfect.—*Moq. in DC. Prod.* xiii. ii. 284; *T. virgatum*, *A. Cunn.; Moq. l.c.* 286.

Hab.: Flinders River, *Bowman*; Curriwillinghamie, *Dalton*; Armadilla, *W. Barton*.

3. **T. dissitiflorum** *F. v. M. Fragm.* iv. 89; *Benth. Fl. Austr.* v. 223. Erect and branching, hard and almost woody at the base, the branches and foliage more or less hoary with a minute stellate tomentum, the older foliage black when dry. Leaves oval oblong or shortly lanceolate, obtuse or acute, rather thick,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long or the upper ones smaller, contracted into a short petiole. Spikes interrupted, close above the last leaves, 1 to 3 in. long, the flowers more or less distant. Bracts ovate or lanceolate, acute, about 2 lines long, the upper ones brown and scarious, the lower ones thicker and tomentose; bracteoles rather broader and more scarious. Perianth 6 to 7 lines long, the tube nearly 1 line long and hirsute with short white hairs, the segments narrow, rigid, plumose outside, the glabrous tips not 1 line long, the three inner ones rather smaller and woolly inside towards the base. Staminal cup very woolly-hairy outside, with a few hairs also on the filaments. Ovary glabrous; style excentric.

Hab.: Gulf of Carpentaria, *F. v. Mueller*.

4. **T. distans** (distant), *R. Br. Prod.* 415; *Benth. Fl. Austr.* v. 223. A perennial with a hard stock at length woody, and erect virgate slender simple or branched stems of 1 to 2 ft., glabrous as well as the foliage. Leaves narrow-linear, almost filiform, the lower ones sometimes 2 in. long, the others much smaller and distant. Spikes terminal, slender and interrupted, 3 or 4 lines long, the flowers all distant, or in luxuriant specimens twice as long with the upper flowers more crowded. Bracts and bracteoles narrow-ovate or oblong, scarious and shining, 2 to 3 lines long, all similar or the bracteoles smaller narrower and more acute. Perianth about  $\frac{1}{2}$  in. long, the tube about  $\frac{1}{2}$  line, the segments narrow, rigid, plumose on the back with small narrow glabrous tips, all glabrous inside. Staminal cup shortly free, with copious articulate hairs outside more or less continued on the filaments. Ovary hirsute on the top.—*Moq. in DC. Prod.* xiii. ii. 297; *Ptilotus distans*, *Poir. Dict. Suppl.* iv. 620; *F. v. M. Fragm.* vi. 228.

Hab.: Thursday Island, *F. M. Bailey*, *A. Cunningham*; Rockingham Bay, *Dallachy*; Cape River, *Bowman*.

5. **T. alopecuroideum** (Foxtail-grass like), *Lindl. in Mitch. Three Exped.* ii. 13, but not of *Bot. Reg.*; *Benth. Fl. Austr.* v. 224. A perennial with ascending or erect slightly-branched stems of 1 to 3 ft., the young shoots and foliage often sprinkled with short crisped hairs, becoming at length glabrous. Leaves linear or lanceolate, acute, the lower ones often several in. long and contracted into a long petiole, the upper ones few small and more sessile. Spikes on long terminal peduncles, becoming very soon cylindrical, attaining sometimes 6 in. or more and from a little more than 1 in. to above  $1\frac{1}{2}$  in. diameter. Bracts and bracteoles broadly ovate or orbicular, obtuse, or with a small point, wholly scarious and shining, with the central nerve scarcely conspicuous,  $1\frac{1}{2}$  to 3 lines long. Perianth

pale yellow or straw colour, the tube exceedingly short, the segments  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, narrow, obtuse, but appearing acute from the involution of the margins at the tip, the dorsal hairs not so copious as in some species and all glabrous inside. Staminal cup shortly prominent, surrounded by long straight hairs sometimes very few sometimes copious; stamens very unequal, one or two of the filaments usually short and without anthers. Ovary glabrous.—Moq. in DC. Prod. xiii. ii. 296; *Ptilotus alopecuroides*, F. v. M. Fragm. vi. 227; *T. giganteum*, A. Cunn.; Moq. l.c. 296; *T. pallidum*, Moq. l.c. 295 (very tall and stout specimens); *T. Preissii*, Nees in Pl. Preiss. i. 629; Moq. l.c. 295; *T. candicans*, Nees in Pl. Preiss. i. 629; Moq. l.c. 296 (with rather broader leaves and the stems somewhat procumbent at the base).

Hab.: Armadilla, *W. Barton*; Curriwillinghamie, *Dalton*. Common on Downs.

6. **T. nobile** (notable), *Lindl. in. Mitch. Three Exped.* ii. 22; *Benth. Fl. Austr.* v. 224. A stout erect, glabrous perennial, the stems simple or slightly-branched upwards, 1 to 3 ft. high. Leaves from broadly obovate to oblong, rarely lanceolate, the lower ones chiefly radical on long petioles, obtuse or mucronate, the upper ones narrower and more sessile. Spikes terminal, oblong, attaining 3 to 6 in. in length and nearly 2 in. diameter, the rachis very densely hairy. Bracts 3 to 5 lines long, ovate or oblong, the midrib prominent and projecting into a point, scarious but with a dark centre, especially towards the tip; bracteoles similar but rather smaller and often with a few dorsal hairs. Perianth usually about 1 in. long, of a greenish yellow, the tube 1 to  $1\frac{1}{2}$  line long and densely hirsute with short hairs, the segments narrow, copiously plumose with dorsal hairs, the glabrous tips short, obtuse in the outer segments, more acute in the inner, all without any wool inside but a few long straight hairs round the base of the stamens, which are not united above the perianth-tube, the filaments very unequal, and 1 or 2 without anthers. Ovary glabrous.—Moq. in DC. Prod. xiii. ii. 286; *T. densum*, A. Cunn.; Moq. l.c. 289.

Hab.: Charlotte Plains, *W. A. L. Ivory*.

7. **T. macrocephalum** (long-headed), *R. Br. Prod.* 415, not of others; *Benth. Fl. Austr.* v. 225. Stems from a hard perennial base erect or ascending, simple stout and rigid, 1 to 2 ft. high, usually glabrous as well as the foliage. Leaves few at the base of the stem, linear or narrow-lanceolate, acute or rarely obtuse, contracted into a long petiole, 2 to 4 in. long, the upper ones smaller few and distant. Spikes solitary, at first ovoid, at length cylindrical, attaining 4 or 5 in. in length and at least 2 in. diameter. Bracts scarious and very shining, obtuse or mucronate, without prominent midribs or dark colour, about  $\frac{1}{2}$  in. long and the bracteoles nearly as large. Perianth yellow,  $\frac{3}{4}$  to above 1 in. long, the tube very short, the segments narrow, rigid, densely plumose outside, with short glabrous tips, all nearly equal without any internal wool, although a few of the marginal hairs at the base of the inner ones may be turned inside round the stamens. Filaments very unequal, filiform scarcely dilated at the base, very shortly united above the perianth-tube, and surrounded by a few long hairs, the shorter filaments usually without any anther. Ovary glabrous, but a few hairs often on the style.—*Ptilotus macrocephalus*, *Poir. Dict. Suppl.* iv. 620; *T. angustifolium*, and *T. pachcephalum*, Moq. in DC. Prod. xiii. ii. 293, 294; *Ptilotus pachcephalus*, F. Muell. Fragm. vi. 228; *T. fusiforme*, *Lindl. in Mitch. Trop. Austr.* 383, and A. Cunn. Herb., not of R. Br.

Hab.: In the interior, *Mitchell*; Newcastle Range, Burnett and Dawson Rivers, *F. v. Mueller*; Bowen River, *Bowman*; Kennedy District, *Daintree*; Charters Towers, *C. F. Plant*. Not uncommon on Downs country.

8. **T. corymbosum** (corymbose), *Gaudich. in Freyc. Voy. Bot.* 444, not of *Spreng.*; *Benth. Fl. Austr.* v. 226. A glabrous perennial (or sometimes annual?) with rigid ascending or erect simple or branched stems of 1 to 2 or even 3 ft.

Leaves linear or linear-lanceolate, mucronate-acute, sessile or contracted into a petiole, the larger ones 1 to 2 in. long, but mostly small and distant. Spikes globular or ovoid or rarely at length cylindrical, about 1 in. diameter, on rather long peduncles, forming a loose irregular panicle. Bracts and bracteoles broad, obtuse, thinly scarious, rather brown but without prominent midribs, not half as long as the perianth. Perianth about  $\frac{3}{4}$  in. long, the segments free almost from the base, all nearly equal, and glabrous inside, with broad scarious white margins, the green centre alone hirsute outside with articulate hairs much shorter than in any allied species. Stamens very unequal, the filaments shortly dilated at the base and very shortly united, 1 or 2 of the shorter ones without anthers, surrounded by a few woolly hairs proceeding chiefly from their base. Ovary glabrous. Style excentric.—Moq. in DC. Prod. xiii. ii. 291; *T. Gaudichaudii*, Steud. Nom. Bot. ed. 2; *Hemisteirus psilotrichoides*, F. Muell. in Linnæa, xxv. 435; *Ptilotus hemisteirus*, F. Muell. Fragm. iv. 90, vi. 231.

Hab.: Inland localities.

Var. *parviflora*. Perianth scarcely above 4 lines long.

When the spike elongates, the species bears much resemblance to *T. alopecuroideum*, but the leaves are much narrower, and the shortness of the perianth-hairs gives the spike an almost glabrous aspect.—*Benth.*

9. **T. exaltatum** (tall), *Benth. Fl. Austr.* v. 227. A stout perennial, with a thick stock and erect stems, attaining 2 or 3 ft., usually branching in the upper portion, glabrous or hirsute with spreading hairs. Radical and lower leaves oblong-lanceolate, attaining 3 to 5 in., rather thick, contracted into a long petiole, the upper ones small, sessile, broad and narrow, often undulate or with crisped margins. Spikes erect, on long peduncles, at first ovoid-conical, at length oblong-cylindrical, about  $2\frac{1}{2}$  in. diameter. Bracts and bracteoles rarely half as long as the perianth, ovate-lanceolate, mucronate, scarious with a brown midrib and sometimes broadly brown towards the end, the bracteoles usually rather shorter than the bracts. Perianth rarely above  $\frac{3}{4}$  in. long and sometimes rather shorter, the tube above 1 line long, the segments narrow, rigid and almost acute, plumose outside with long articulate hairs, the short glabrous tips of a dull red colour, the inner ones with dense wool inside below the middle. Stamens unequal, the filaments dilated but scarcely united at the base, or 2 of the shorter ones without anthers. Ovary of the Queensland plants hairy, contracted into a rather long stipes.—*Ptilotus exaltatus*, Nees in Pl. Preiss. i. 630 (from the character given); Moq. in DC. Prod. xiii. ii. 281; *T. macrocephalum*, Moq. l.c. 290, not of R. Br.; *T. alopecuroideum*, Lindl. Bot. Reg. 1839, t. 28, but not the plant originally described in Mitch. Three Exped.; *Ptilotus nobilis*, F. v. M. Fragm. vi. 227, partly.

Hab.: Suttor River, *Sutherland*; Cape River, *Bowman*; Armadilla, *Barton*; Curriwillinghie, *Dalton*; Northcote, *R. C. Burton*.

10. **T. semilanatum** (half-woolly), *Lindl. in Mitch. Trop. Austr.* 45; *Benth. Fl. Austr.* v. 227. A perennial with a tufted stock and erect simple or slightly branched stems of 6 in. to 1 ft., more or less pubescent as well as the foliage with short crisped hairs or quite glabrous. Leaves linear or linear-lanceolate, acute, the radical ones not persistent at the time of flowering, the lower ones petiolate, 1 to 2 in. long, the upper ones more sessile and smaller, the margins flat or undulate-crisped. Spikes at first depressed or hemispherical at length globular, about  $1\frac{1}{2}$  in. diameter. Bracts about 2 lines long, ovate-lanceolate, mucronate, more or less brown in the centre and tips; bracteoles broader, more obtuse and not brown. Perianth about  $\frac{3}{4}$  in. long, the tube about  $\frac{3}{4}$  line, the segments narrow, rigid, plumose on the back, with short glabrous pink tips; the inner ones with long wool inside below the middle not very copious. Filaments dilated at the base, shortly connate, 1 or 2

short and without anthers. Ovary hairy on the top.—Moq. in DC. Prod. xiii. ii. 462; *T. pulchellum* A. Cunn. and *T. setigerum*, A. Cunn.; Moq., l.c. 290; *Ptilotus nobilis*, F. v. M. Fragm. vi. 227 partly.

Hab.: Head of the Gilbert River, *F. v. Mueller*; Wide Bay, *Bidwill*; Rockhampton, *O'Shanesy*; Midge Creek, *Bowman*; Warwick, *Beckler*; Darling Downs, *Lau*. Very abundant on Downs country.

The species is very near *T. exaltatum*, from some species of which it is difficult to distinguish it. The spikes, however, are always shorter, the bracts smaller and more scarious and the foliage different.—*Benth.*

11. **T. Burtonii** (after R. C. Burton), *Bail. Bot. Bull.* 2. A perennial with a hard tufted stock. Stems sulcate, slightly hairy in decurrent lines from base of leaf, and more or less densely woolly-hairy near the inflorescence. Radical leaves about 1½ in. long including the rather long petiole, obovate or broadly spatulate, and prominently mucronate, the lamina decurrent on the petioles, expanding and stem-clasping at the base. Stem-leaves much smaller of somewhat similar form, nearly sessile, the apex pungently mucronate. Spikes at first ovoid-conical, at length cylindrical, still with a conical apex, attaining 3 or more inches in length, and a diameter of 1½ in. Bracts and bracteoles lanceolate, about one-third the length of perianth, scarious and more or less dark coloured, both acutely acuminate, but the bracteoles not so dark and rather less than the bracts. Perianth ¾ in. long, the tube slightly turbinate, very short, hirsute with long hairs outside; segments narrow, rigid, with obtuse glabrous rosy tips about 1 line in length, the remainder plumose outside with long articulate hairs, the hairs of the margins near the base very long and flexuous, covering the inner surface, which, however, is glabrous. Filaments dilated at the base but not united above the perianth-tube in any of the flowers examined, 2 reduced to staminodia. Anthers rather large, oblong. Ovary shortly stipitate, glabrous except the top, which is woolly-hairy. Style excentric, quite glabrous, pink towards the small brown stigma. Seed glossy.

Hab.: Towards Georgina River, *R. C. Burton*.

12. **T. fusiforme** (spindle-shaped), *R. Br. Prod.* 415; *Benth. Fl. Austr.* v. 234. A perennial with a fusiform rhizome and slender erect branching stems of 1 to 2 ft. Leaves narrow-linear or almost filiform, the lower ones often 2 in. long, the upper ones few small and distant. Spikes ovoid, about 1 in. diameter, on long slender branches or peduncles. Bracteoles broad, very obtuse, closely enveloping the perianth, very thin and shining, about 2 lines long, the bracts shorter and more acute. Perianth 5 to 6 lines long, the segments free almost or quite to the base, narrow, rigid, 3-nerved, plumose outside with rather rigid long hairs, with short glabrous tips rather longer and more obtuse in the outer than the inner segments, all glabrous inside. Staminal cup very short, densely covered outside with long straight hairs; filaments unequal, all antheriferous or one without an anther. Ovary densely hairy.—Moq. in DC. Prod. xiii. ii. 294; *Ptilotus fusiformis*, Poir. Dict. Suppt. iv. 619.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Normanton, *T. A. Gulliver*.

13. **T. gracile** (slender), *R. Br. Prod.* 415; *Benth. Fl. Austr.* 235. Very near *T. fusiforme*, and the structure of the flowers the same, but an annual with still more slender branching stems, the leaves filiform, the spikes globular not above ¾ in. diameter, and the perianth only about 4 lines long with much shorter glabrous tips.—Moq. in DC. Prod. xiii. ii. 294; *Ptilotus gracilis*, Poir. Dict. Suppl. iv. 620.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

14. **T. calostachyum** (spikes beautiful), *F. v. M. in Benth. Fl. Austr. v. 236*. An erect slender slightly branched annual of 1 to 2ft. Leaves few, very narrow-linear, almost filiform, the lower ones 1 to 2in. long, the upper ones small and distant. Spikes on slender peduncles, at first conical, at length oblong-cylindrical, 1 to 1½in. long. Bracts and bracteoles ovate, mucronate, very thin and shining, 1½ to 2 lines long. Perianth pink, 2½ to 3 lines long, the segments free from the base, scarious, densely plumose outside with fine hairs short in the lower part, longer in the upper half, with shortly glabrous obtuse tips, the 3 inner ones rather shorter, with woolly hairs inside towards the base but on the segments and not on the staminal cup. Filaments slightly unequal, all bearing anthers, united in a short cup with linear or lanceolate exceedingly thin scales between them fringed or glandular on the margin. Ovary glabrous.—*Arthrotrichum calostachyum*, *F. v. M. in Trans. Bot. Soc. Edin. vii. 500*; *Ptilotus calostachyum*, *F. v. M. Fragm. vi. 231*.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

The habit approaches that of some of the annual *Ptiloti*, the scales between the stamens are somewhat variable but present in all the flowers examined, usually about ¼ line long, the other characters are entirely those of *Trichinium*.

15. **T. ærvoides** (Ærva-like) *F. v. M. Fragm. iii. 123*; *Benth. Fl. Austr. v. 240*. Probably perennial and procumbent. Stems branching, the young shoots and peduncles clothed with white woolly hairs. Leaves ovate or ovate-lanceolate, acute, contracted into a rather long petiole, ½ to 1in. long. Spikes numerous, solitary or 2 or 3 together on short axillary or terminal peduncles, ovoid or conical (or at length cylindrical?), 3 to 4 lines diameter. Bracts ovate, acute, with brown tips, the bracteoles more transparent broader and more obtuse, all about as long as the perianth and usually bearing dorsal hairs at the base. Perianth scarcely 2 lines long, the segments free from the base, rigid, acute, plumose outside with short glabrous tips, glabrous inside. Filaments unequal, united at the base in a short glabrous truncate cup, 1, 2 or 3 of them without anthers. Ovary densely villous on the top.—*Ptilotus ærvoides*, *F. v. M. Fragm. vi. 231*.

Hab.: Roxburgh Downs, Georgina, &c.

## 6. CYATHULA, Lour.

(A little cup).

Sepals 5, scarious, 1-nerved, acuminate or with hooked rigid awns. Stamens 5, connate, united below with the linear lacerate or 2-fid staminodes into a cup, anthers 2-celled. Ovary obovoid; style filiform, stigma capitate; ovule 1, pendulous from a long basal funicle. Utricle ovoid, indehiscent, top areolate. Seeds inverse, oblong, testa coriaceous; embryo annular, cotyledons linear, flat.—Herbs or undershrubs. Leaves opposite. Flowers clustered, clusters solitary, spicate and reflexed in fruit, or in dense, globose, solitary or spicate heads; perfect flowers 1 or 2 in each cluster, surrounded by imperfect ones reduced to sepals, with rigid hooked awns.

The species belong to Asia, Africa, America and Australia.

1. **C. prostrata** (prostrate), *Blume, Bijl. 549*; *Hook. Fl. Brit. Ind. iv. 723*. Stems ascending from straggling almost prostrate branches usually slender and from 6in. to 2ft. high, clothed as well as the foliage with close, white, silky hairs. Leaves petiolate or nearly sessile, elliptic, rhomboid-oblong, or the lower ones subpanduriform and obtuse, 1 to 2in. long. Spikes very slender, terminal, 4 to 6in. long, sometimes branched, silky-pubescent. Sepals oblong or somewhat lanceolate. Staminodes 2-fid or retuse. Seeds ovoid-oblong.—*C. geniculata*, Lour.; *Achyranthes prostrata*, Linn., *Desmocheta prostrata* and *micrantha* DC., *D. prostrata*, Wight Ic. t. 733.—Rheede, Hort. Mal. x. t. 79.

Hab.: Mulgrave River and other tropical scrubs.

Slightly purgative and digestive; used for dysentery in native medicine in Ceylon.—*Trimen*.

7. *ACHYRANTHES*, Linn.

(Alluding to the chaffy nature of flowers).

Flowers hermaphrodite. Perianth-segments 5, slightly unequal, hardened after flowering and erect, enclosing the fruit, usually glabrous. Stamens 5, united in a cup at the base, with as many small scales or staminodia between them. Anthers 2-celled. Ovary uniovulate. Style simple, with a capitate stigma. Fruit a membranous indehiscent utricle enclosed in the perianth. Seed solitary.—Herbs. Leaves opposite. Flowers green and rigid or rarely scarious, reflexed, in terminal heads or long spikes. Bracteoles subulate, rigid and often spinescent.

The genus is widely distributed over the tropical and subtropical regions of the Old World. The only Australian species is a common weed over the whole range of the genus.

1. *A. aspera* (rough), Linn.; Moq. in DC. Prod. xiii. ii. 314; Benth. Fl. Austr. v. 216. An erect or spreading annual or biennial, with a hard almost woody base and branching stems of 2 or 3ft., more or less hoary as well as the foliage with a soft pubescence. Leaves shortly petiolate ovate, ovate-oblong or almost oblong, obtuse or shortly acuminate and acute, usually 1 to 2in. but sometimes 3in. long. Flowers of a shining green, in long slender but rigid terminal spikes. Perianth  $1\frac{1}{2}$  to nearly 2 lines long, closely reflexed after flowering. Bracteoles rigidly subulate or spinescent (but not spreading as in *Nyssanthès*), usually nearly as long as the perianth, but variable in length, dilated and scarious at the base.—Wight, Ic. Pl. t. 1777; *A. australis*, R. Br. Prod. 417; Moq. in DC. Prod. xiii. ii. 313.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Broussard, *R. Brown*; Albany Island, *F. v. Mueller*; Cape York, *Daemel*; Rockingham Bay, *Dallachy*; Rockhampton, a common weed, *O'Shanesij*; Nerkool Creek, *Bowman*; Moreton Bay, *Leichhardt*, *F. v. Mueller*.

Var. *canescens*. This is more pubescent or hoary-villous, with thicker leaves and rather larger perianths, passing very gradually into the commoner forms.—Islands of the Gulf of Carpentaria, *R. Brown*.

8. *NYSSANTHES*, R. Br.

(Referring to the flowers being prickly).

Flowers hermaphrodite. Perianth-segments 4, of which 2 upper ones smaller, all hardened after flowering and erect, enclosing the fruit, all or the 2 outer ones more or less spinescent. Stamens 2 or 4, united in a cup at the base, with as many short scales or staminodia between them. Anthers 2-celled. Ovary uniovulate. Style with a capitate stigma. Fruit a membranous indehiscent utricle, enclosed in the perianth. Seed solitary.—Herbs. Leaves opposite. Flowers green and rigid, very spreading or reflexed after flowering, in sessile head-like spikes or clusters, the bracts and bracteoles spinescent and very spreading.

The genus is limited to Australia, differing slightly from *Achyranthes* in its inflorescence, spreading bracts and constantly 4-merous flowers.—Benth.

Stamens 4	.....	1. <i>N. erecta</i> .
Stamens 2	.....	2. <i>N. diffusa</i> .

1. *N. erecta* (erect), R. Br. Prod. 418; Benth. Fl. Austr. v. 247. Erect and probably 2ft. high or more, the upper flowering portion with spreading opposite dichotomous branches, the whole plant more or less pubescent with soft appressed hairs. Leaves elliptical-oblong or almost lanceolate, mostly acute, contracted into a short petiole, those on the main stem and the lower floral ones 1 to 3in. long, the upper floral ones very small. Flowers in dense clusters or short spikes sessile in the upper axils and forks of the panicle, each flower sessile within a spinescent bract shortly dilated and scarious at the base, and 2 similar but smaller bracteoles very divaricate on the fruiting perianth. Perianth with 2 outer segments about  $1\frac{1}{2}$  line long but unequal, hairy, lanceolate, tapering into

a rigid spinescent point, with 2 or 3 more or less conspicuous nerves on each side of the prominent midrib, the 2 inner ones smaller glabrous and scarcely nerved. Stamens 4, the filaments short, the intervening scales or staminodia broad, truncate, about half as long as the filaments. Fruit nearly globular, about  $\frac{3}{4}$  line long, membranous except the depressed summit which is harder.—Moq. in DC. Prod. xiii. ii. 309.

Hab.: Dawson and Brisbane Rivers, *F. v. Mueller*. I have never met with specimens of this plant.

I have seen but few specimens. The perianths are usually but not always more thickened at the base and reflexed than in *N. diffusa*. The spinescent bracts and summits of the perianth-segments are very variable in length and relative proportions, but they are usually, especially the bracteoles, shorter than in *N. diffusa*. The difference in the stamens appears to be constant.—*Benth.*

**2. *N. diffusa*** (diffuse), *R. Br. Prod.* 418, *Benth. Fl. Austr.* v. 217. An annual or biennial closely allied to *N. erecta*, but usually more branched from the base, more slender, and the parts smaller. Stems attaining 1 to 3ft., the greater portion consisting of a broad leafy panicle, the branches dichotomous or the lower ones trichotomous. Leaves ovate or oblong, obtuse or acute, rarely much above 1in. and mostly small. Spikes or clusters of flowers very short, in the axils and in the forks of the panicle, the flowers usually smaller than in *N. erecta*, but the segments as well as the bracts and bracteoles even more variable in size and relative proportions than in that species; sometimes all three bracts are subulate almost from the base and 3 to 4 lines long, more frequently the bracteoles are much shorter, but all three very divaricate; one of the outer perianth-segments usually long, the other much shorter, both spinescent, the inner ones lanceolate and tapering into a shorter spine. Stamens always 2 only, with short broad truncate scales or staminodia between them.—Moq. in DC. Prod. xiii. ii. 308; *N. media*, *R. Br. Prod.* 418; Moq. l.c. 309.

Hab.: Shoalwater Bay, *R. Brown*; Brisbane River, *F. v. Mueller*; Rockhampton, *Sutherland O'Shanesy*; Nerkool Creek, *Bowman*.

### 9. **ALTERNANTHERA**, *R. Br.*

(Stamens alternate with staminodia.)

(*Telanthera*, *Moq.*)

Flowers hermaphrodite. Perianth divided to the base into 5 segments, all equal or the outer ones larger, ovate or lanceolate, scarious and coloured (usually white) glabrous or with long woolly hairs at the base. Stamens united at the base into a short exceedingly thin cup; filaments short with or without intervening teeth or lobes, unequal, 2 or three of them often without anthers and reduced to short teeth. Anthers small. Ovary uniovulate; style short sometimes scarcely any, with a capitate stigma. Fruit an indehiscent utricle usually compressed. Seeds vertical.—Annual or perennial herbs, mostly prostrate, glabrous or softly hairy. Leaves opposite. Flowers small, in axillary sessile or pedunculate spikes (very rarely also terminal), usually short or oblong. Bracts and bracteoles scarious.

The genus is widely spread over the warmer regions of both the New and the Old World. The extreme tenuity of the staminal cup renders it exceedingly difficult to ascertain its form, unless examined in the bud before the enlargement of the ovary.—*Benth.*

Staminal cup without teeth between the filaments.

Perianth perfectly glabrous.

Plant glabrous or slightly pubescent at the nodes or in two decurrent lines. Leaves narrow.

Perianth-segments and bracteoles (above  $1\frac{1}{2}$  lines long) with fine points. Spikes at length several together in dense globular clusters . . . . .

1. *A. nodiflora*.

Perianth-segments and bracteoles (1 line long or under) broad with short points. Spikes small, at length cylindrical and scarcely astered . . . . .

2. *A. denticulata*.



Plant more or less hairy or rarely glabrous. Leaves mostly broad.

Rhachis of the spike woolly. . . . . 3. *A. nana*.

Perianth-segments enveloped in long woolly hairs proceeding from the base (often concealed in the young spike by the bracteoles).

Bracteoles shorter than the perianth. Perianth-segments all equal (about 1 line long) and glabrous inside . . . . . 4. *A. angustifolia*.

Bracteoles as long as the perianth. Perianth-segments  $1\frac{1}{2}$  to 2 lines long, the inner ones smaller and woolly inside at the base.

Bracteoles and perianth-segments very acute. Spikes all axillary, ovoid. Anthers 5 . . . . . 5. *A. decipiens*.

1. ***A. nodiflora*** (flowers in the form of knots) *R. Br. Prod.* 417; *Benth. Fl. Austr.* v. 249. Stems prostrate, decumbent or ascending, 6in. to 1 or even 2ft. long, glabrous or slightly pubescent in decurrent lines. Leaves linear or lanceolate, shortly contracted at the base, 1 to 2in. long. Spikes globular, about 4 lines diameter when fully out, but often clustered many together into dense globular masses sometimes above 1in. diameter, interspersed with a few small floral leaves. Bracts, bracteoles and perianth-segments narrow, acuminate, with fine points usually about  $1\frac{1}{2}$  line long or rather more. Stamens very short (about  $\frac{1}{4}$  line), the filaments unequal, dilated at the base and united into a minute open cup, 2 or 3 bearing anthers, the others reduced to small teeth. Style distinct though very short. Utricle not half as long as the perianth, much compressed, broad, deeply notched with obtuse thickened margins.—*Moq.* in *DC. Prod.* xiii. ii. 356.

Hab.: Broadsound, *R. Brown*; Armadilla, *Barton*; in the interior, *Mitchell*. Common weed

The species appears to be widely spread over E. India and Africa, but is not always easy to distinguish from *A. denticulata*, and perhaps some others. The Australian specimens when first in flower are very much like those of *A. denticulata*. When fully developed the perianths and bracts are much longer and more acuminate, the fruit shorter in proportion and broader than in *A. denticulata*, and the notch, although variable, usually much deeper.—*Benth*

2. ***A. denticulata*** (toothed), *R. Br. Prod.* 417; *Benth. Fl. Austr.* v. 249. Stems prostrate, creeping and rooting at the lower nodes, often extending to 2 or 3ft. and shortly ascending, glabrous or minutely pubescent in decurrent lines. Leaves linear or linear-lanceolate, obtuse or mucronate, shortly contracted at the base, mostly  $\frac{3}{4}$  to  $1\frac{1}{2}$ in. long. Spikes globular or at length ovoid or oblong, about  $\frac{1}{2}$ in. diameter, closely sessile in the axils and sometimes 2 or 3 together but not so densely clustered as in *A. nodiflora*, usually quite glabrous. Perianth segments under 1 line long, very acute though shorter pointed than in *A. nodiflora*. Stamens and style entirely of that species. Utricle shorter than the perianth; compressed and broadly orbiculate or truncate, but longer in proportion and less notched than in *A. nodiflora*, shorter in proportion than in *A. sessilis*.—*Moq.* in *DC. Prod.* xiii. ii. 356; *Ilcebrun denticulatum*, *Spreng. Syst.* i. 820; *A. sessilis*, *Br. var.* *Hook. f. Fl. Tasm.* i. 310.

Hab.: Keppel Bay, *R. Brown*; Port Denison, *Fitzalan*; Rockhampton, *O'Shanesy*; Gilbert River, *Daintree*; Armadilla, *Barton*; Darling Downs, *Lau*. A very common weed.

Sometimes very difficult to distinguish from *A. nodiflora*, especially when first coming into flower, and on the other hand very near some varieties of the widely-distributed *A. sessilis*, *Br.*, with which *J. D. Hooker*, perhaps not incorrectly, unites it. In general it differs slightly in the narrower leaves, glabrous spikes, more acute flowers and shorter utricles.

*Var. ? micrantha.* Smaller and more slender and sometimes slightly pubescent. Leaves linear,  $\frac{1}{2}$  to 1in. long. Spikes  $1\frac{1}{2}$  lines diameter, with a few hairs on the rhachis. Perianth-segments  $\frac{1}{2}$  to  $\frac{3}{4}$  line long, scarcely mucronate, the flowers very deciduous, leaving the bracts persistent. Not so common as the type form.

3. ***A. nana*** (dwarf), *R. Br. Prod.* 417; *Benth. Fl. Austr.* v. 250. Stems prostrate or ascending, loosely pubescent as well as the foliage, and often woolly at the nodes. Leaves oblong lanceolate or almost linear, obtuse or acute, tapering at the base and shortly petiolate,  $\frac{3}{4}$  to  $1\frac{1}{2}$ in. long or in the

broader limbed specimens under  $\frac{3}{4}$  in. Spikes sessile in the axils, about  $\frac{1}{4}$  in. diameter, at first depressed globular but at length ovoid or shortly cylindrical, 4 or 5 lines long and very shining, the rhachis woolly. Perianth-segments oblong or lanceolate with a small point, thickened and hardened at the base when in fruit,  $1\frac{1}{4}$  to above  $1\frac{1}{2}$  line long, glabrous as well as the short bracts and bracteoles. Stamens very short, the filaments filiform or slightly dilated at the base, usually 3 bearing anthers and 2 reduced to small teeth. Utricle scarcely half so long as the perianth.—Moq. in DC. Prod. xiii. ii. 360; *Ilcebrum nanum*, Spreng. Syst. i. 819.

Hab.: Broadsound, *R. Brown*; Brisbane River, *F. v. Mueller*; Stanthorpe.

Var. *major*. Larger and more hairy, leaves longer, perianth-segments acute.—Rockhampton, *O'Shanesy*.

The species is very variable, especially as to the size of the flowers, and some specimens come very near some forms of *A. sessilis*, but always with the utricle much shorter in proportion to the perianth. Brown's specimens as well as some of *F. v. Mueller*'s have the flowers much smaller than in the others.

4. ***A. angustifolia*** (leaves narrow), *R. Br. Prod.* 417, but not of *Moq.*; *Benth. Fl. Austr.* v. 250. Prostrate, glabrous or slightly hoary-pubescent. Leaves linear in the typical form, above 1 in. long and much like those of *A. denticulata* or even narrower. Spikes sessile, solitary or rarely clustered, seldom above  $\frac{1}{4}$  in. diameter and mostly smaller and very short, the rhachis more or less woolly. Bracts very acute, glabrous, shorter than the perianth. Perianth-segments lanceolate, acute, 1 line long or a little more, with long woolly hairs outside; the inner ones narrower than the outer. Filaments short, only 3 bearing anthers, all dilated at the base. Stigma capitate, sessile in the flowers examined.—*Ilcebrum angustifolium*, Spreng. Syst. i. 818.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

5. ***A. decipiens*** (apt to be taken for another), *Benth. Fl. Austr.* v. 251. Apparently a small annual, the specimens under 6 in., branching and softly hirsute. Leaves ovate or ovate-lanceolate, rather acute, contracted into a rather long petiole. Spikes numerous, axillary, closely sessile, ovoid and about  $\frac{1}{4}$  in. long in the specimens seen but still very young. Bracteoles 2 lines long, narrow and tapering into a fine point. Perianth enveloped in long silky woolly hairs, the segments narrow and tapering into fine points. Stamens all five perfect in the specimens examined.

Hab.: Subtropical Australia, *Mitchell*, (*Herb. Hook.*).

## 10. GOMPHRENA, Linn.

(Referring to the flowers being wedge-shaped.)

(*Philoxerus*, *R. Br.*)

Flowers hermaphrodite. Perianth divided to the base into 5 segments, all equal or the outer ones rather larger, linear, scarious and coloured with the centre green at least at the base, woolly outside below the middle or glabrous. Stamens united at the base in a long or short tube, the free parts of the filaments short, with or without intervening teeth or scale-like lobes; anthers 1-celled. Ovary uniovulate; style short or filiform, with 2 short, often minute, linear stigmatic lobes. Fruit an indehiscent utricle. Seed vertical. Annual or perennial herbs, glabrous or with more or less of soft woolly hairs. Leaves opposite. Flowers in terminal or rarely axillary spikes usually dense, either shortened into globular or hemispherical heads or more or less lengthened ovoid-oblong or cylindrical. Bracts and bracteoles scarious, glabrous, the bracteoles more or less complicate and keeled. Ovary glabrous.

The genus comprises a considerable number of species, the extra-Australian ones all from the warmer regions of America, one of which (*G. globosa*) of early cultivation in gardens, is now a common weed in E. India, Queensland and New Guinea.

- Heads large globose with 2 leafy bracts; bracteoles pinkish-purple . . . . . 1. *G. \*globosa*.  
 Staminal tube longer than the ovary. Spikes globular or ovoid, usually large. Filaments flat. Leaves linear.  
 Staminal tube with filiform teeth between the filaments. Spikes globular.  
 Perianth-segments acute. Annual . . . . . 2. *G. canescens*.  
 Staminal tube without teeth or lobes between the filaments.  
 Annual of 1 to 2ft. Spikes of length ovoid or oblong. Perianth-segments obtuse . . . . . 3. *G. flaccida*.  
 Perennial under 1ft. Spikes hemispherical or globular. Perianth-segments rather obtuse . . . . . 4. *G. humilis*.  
 Staminal tube shorter than the ovary. Spikes rarely above  $\frac{1}{2}$  in. diameter.  
 Spikes hemispherical or globular. Perianth very woolly outside below the middle. Staminal tube with teeth or lobes between the filaments.  
 Leaves linear. Bracts much shorter than the bracteoles . . . . . 5. *G. Brownii*.  
 Spikes ovoid or oblong-cylindrical. Perianth woolly below the middle.  
 Spikes 5 lines diameter. Leaves all linear. Filaments broad and 2 or 3-toothed at the end . . . . . 6. *G. conica*.  
 Spikes 3 or 4 lines diameter, densely crowded with broadly-lanceolate floral leaves. Filaments tapering at the end . . . . . 7. *G. conferta*.  
 Spikes at length narrow-cylindrical. Perianth small, quite glabrous.  
 Leaves hairy, lanceolate to oblong . . . . . 8. *G. diffusa*.

1. ***G. \*globosa*** (globular), *Lin.*; *Sp. Pl.* 224; *Hook in Fl. Brit. Ind.* iv. 732. A dichotomously branched annual, the branches obtusely angled, hairy or subsilky. Leaves 2 to 4in. long, shortly petiolate, elliptic or obovate-oblong, acute or obtuse, scaberulous, pale green. Heads 1 to  $1\frac{1}{2}$  in. diameter, with 2 leafy bracts under the head  $\frac{1}{2}$  to 1in. Bracteoles pinkish purple, lateral with a cristate dorsal wing. Sepals densely woolly, lanceolate, shorter than the staminal tube.—*Wight, Ic.* 1784; *Bot. Mag. t.* 2815.—*Rheede, Hort. Mal. x. t.* 37.

*Hab.*: An American plant. A stray from garden culture in this and many other warm countries. Common in the gardens of the aborigines of New Guinea.

2. ***G. canescens*** (hoary), *R. Br. Prod.* 416; *Benth. Fl. Austr.* v. 253. An erect more or less branching annual, usually stout and hard, 1 to nearly 2ft. high, more or less hoary with long soft hairs, the older parts rarely glabrous. Leaves linear or linear-lanceolate, acute, the larger ones 2 to 3in. long, the margins usually recurved. Spikes globular, sessile between the last leaves, about 1in. diameter, the rachis thick, ovoid or globular, woolly. Bracts and bracteoles thinly scarious, lanceolate, acute, about 3 lines long. Perianth-segments about 5 lines long, narrow, acute, 1-nerved, slightly woolly on the back below the middle, glabrous inside. Filaments united in a tube variable in length, but always much longer than the ovary, the free portion short, flattened, with intervening filiform teeth or lobes, sometimes as long as the anthers, but often shorter. Style filiform.—*Moq. in DC. Prod.* xiii. ii. 398; *Philoxerus canescens*, *Poir. Dict. Suppl.* iv. 393.

*Hab.*: Gulf of Carpentaria, *R. Brown, Henne*.

3. ***G. flaccida*** (weak), *R. Br. Prod.* 416; *Benth. Fl. Austr.* v. 254. An erect annual of 1 to  $1\frac{1}{2}$  ft., simple or branched, usually more slender than *G. canescens*, but sometimes as stout, the young parts woolly, becoming at length nearly glabrous. Leaves linear or linear-lanceolate, 1 to 2in. or rarely longer, those under the spike much smaller. Spikes at first globular, but soon becoming ovoid, solitary or 2 or 3 in a close cluster at the ends of the branches, about  $\frac{3}{4}$  in. diameter and sometimes at length nearly 1in. long, the rachis woolly. Bracts  $2\frac{1}{2}$  to 3 lines long, the bracteoles much complicate and keeled. Perianth about 4 lines long, much flattened when old, the segments rather obtuse, slightly woolly outside near the base. Staminal tube varying in length as in *G. canescens*, and

always longer than the ovary, the filaments shortly free and flattened, but without the intervening teeth of that species. Moq. in DC. Prod. xiii. ii. 398; *Philoxerus glaucidus*, Poir. Dict. Suppl. iv. 392; *G. firma*, F. Muell. Fragm. iii. 123.

Hab.: Cape York, *Dacmel*; Blackall.

The filaments are often broad and sometimes irregularly jagged or toothed towards the end, but different in different flowers of the same specimen, and not regularly 3-toothed as described by Moquin in the genus generally, and in this and other species specially.—*Benth.*

4. ***G. humilis*** (low), *R. Br. Prod.* 416; *Benth. Fl. Austr.* v. 254. A perennial, with a woody stock often bearing tufts of wool, the stems erect, branching, 6 to 9 in. high, glabrous as well as the foliage or with a few silky-woolly hairs, especially about the nodes. Leaves narrow-linear, mostly 1 to 1½ in. long, with smaller ones often clustered in the axils. Spikes depressed, almost hemispherical, ½ to 1 in. diameter, mostly pedunculate above the last leaves, or rarely with a pair of small leaves close under them, the rhachis woolly. Bracts and bracteoles glabrous, very thin and transparent, finely 1-nerved, the bracteoles usually about 2 lines long, broad and rather obtuse, the bracts smaller, narrower and more acute, but both variable. Perianth-segments 3 to 4 lines long, pink, rather broad, obtuse or scarcely acute, woolly outside to above the middle. Staminal tube longer than the ovary, usually bearing a few woolly hairs outside, the filaments lanceolate, acuminate, broad or narrow, without intervening teeth.—Moq. in DC. Prod. xiii. ii. 418; *Philoxerus humilis*. Poir. Dict. Suppl. iv. 392.

Hab.: Broadsound, *R. Brown*; Port Denison, *Fitzalan*; Suttor and Bowen Rivers, *Bowman*.

5. ***G. Brownii*** (after R. Brown), *Moq. in DC. Prod.* xiii. ii. 397; *Benth. Fl. Austr.* v. 255. An erect branching annual of 6 to 9 in., hoary with rather long silky or woolly hairs. Leaves linear, mostly ¾ to 1 in. long, acute and soft. Spikes globular or depressed, 4 to 5 lines diameter, sessile or very shortly pedunculate within the last leaves, or pedunculate in the upper axils without floral leaves. Bracteoles transparent, rather broad, acute, as long as the perianth or rather longer, the bracts much shorter. Perianth-segments scarcely 1½ line long, acute, with a narrow opaque centre, densely woolly outside with long hairs. Staminal tube not longer than the ovary though not much shorter, the filament short, with oblong or lanceolate entire or denticulate teeth or lobes between them as long as the anthers.—*G. lanata*, *R. Br. Prod.* 416, not of Poir; *Philoxerous lanatus*, Poir, Dict. Suppl. iv. 392; *Alternanthera Baueri*, Moq. in DC. Prod. xiii. ii. 354.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Suttor River, *Bowman*.

6. ***G. conica*** (conical), *Spreng. Syst.* i. 824; *Benth. Fl. Austr.* v. 256. An erect branching annual of 1 to 1½ ft. with the aspect of *G. glauca*, slightly hoary woolly or glabrous. Leaves linear, with recurved margins, 1 to 2 in. long. Spikes at first ovoid, at length cylindrical, about 5 lines diameter and attaining nearly 1 in. in length, pedunculate and solitary, or (in *R. Brown's* specimens) frequently in clusters of 2 or 3 and more conical. Bracts and bracteoles acute, scarcely half as long as the perianth. Perianth-segments 2½ to 3 lines long, covered outside with long dense wool, with white obtuse glabrous tips. Staminal tube or cup shorter than the ovary; filaments broad, 2-toothed with the anther sessile between the teeth, without intervening lobes or teeth to the cup. Style short.—*Philoxerus conicus*, *R. Br. Prod.* 416; *Iresine conica*, Moq. in DC. Prod. xiii. ii. 342; *Gomphrena breviflora*, F. v. M. Fragm. iii. 125.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

7. ***G. conferta*** (crowded), *Benth. Fl. Austr.* v. 257. Erect hard stout and probably tall, but apparently annual, the specimens very imperfect, the branches bearing a few white woolly hairs and linear or linear-lanceolate leaves of 1 to 2 in.

Spikes ovoid or cylindrical, 3 to 4 lines diameter and some of them above  $\frac{1}{2}$  in. long, sessile and crowded on very short axillary branchlets and surrounded by broadly lanceolate herbaceous softly villous floral leaves about as long as the spikes. Bracteoles very broad and obtuse, rather longer than the perianth; bracts shorter and more acute. Perianth-segments scarcely  $1\frac{1}{2}$  line long, woolly outside to above the middle, the glabrous white tips very obtuse in the outer ones, less so and narrower in the inner. Staminal tube short; filaments dilated at the base, acuminate, without intervening teeth or lobes. Style short.—*Iresine macrocephala*, Moq. in DC. Prod. xiii. ii. 342.

Hab.: Cape Flinders, *A. Cunningham*.

8. **G. diffusa** (diffuse), *Spreng. Syst.* i. 824; *Benth. Fl. Austr.* v. 257. Stems from a perennial often woody stock procumbent, branching, slender, 1 or 2 ft. long, the branches and foliage softly pubescent. Leaves lanceolate, acute, contracted into a very short petiole,  $\frac{1}{2}$  to 1 in. long. Spikes axillary, shortly pedunculate, at first ovoid or oblong but lengthening to  $\frac{1}{2}$  or  $\frac{3}{4}$  in. and not  $\frac{1}{4}$  in. diameter, the rhachis pubescent. Bracts and bracteoles obtuse, as long as the perianth, the bracteoles broad and readily splitting. Perianth-segments about 1 line long, quite glabrous, obtuse, scarious with a narrow opaque centre not reaching either to the summit or to the base. Staminal tube rather shorter than the ovary; filaments short, much dilated, tapering to a point, without intervening teeth or lobes.—*Philoxerus diffusus*, R. Br. Prod. 416; *Iresine Brownii*, Moq. in DC. Prod. xiii. ii. 341.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

This has the habit almost as much of *Alternanthera* as of *Gomphrena*, but the style is decidedly lobed.—*Benth.*

## Order CI. CHENOPODIACEÆ.

(Salsolaceæ, Moq. in DC. Prod. xiii. ii.)

Perianth small, with 5 or fewer segments or lobes, herbaceous or rarely thin and transparent or somewhat scarious, imbricate in the bud. Stamens 5 or rarely fewer, opposite the perianth-segments and usually inserted at or near their base; anthers 2-celled, the cells opening longitudinally. Ovary free, 1-celled, with a single ovule erect or suspended from an erect funicle. Styles or style-branches 2 or three, stigmatic along their whole inner edge or rarely towards the end only. Fruit 1-celled and indehiscent, membranous or succulent, enclosed in or resting on the persistent perianth which is sometimes enlarged or altered in form. Seed solitary, erect or horizontal, usually orbicular and flattened. Embryo coiled round a mealy albumen, or spirally twisted without any or with scarcely any albumen.—Herbs or undershrubs, often succulent and very frequently hoary or white, especially the young parts, with a minute and mealy or more dense and scaly tomentum, or in some genera villous or woolly. Leaves alternate or very rarely opposite, sometimes none. Stipules none. Flowers small, usually sessile and clustered, either axillary or in axillary or terminal dense or interrupted spikes or panicles, and often unisexual. Bracts inconspicuous, or, in some genera, 1 bract and 2 bracteoles more or less conspicuous.

A considerable Order, spread over the greater part of the world, but most abundant in maritime or saline situations in the Old World, a few species, in identical or closely allied forms, being quite cosmopolitan.

**SUBORDER I. Chenopodieæ.**—Stem not twining. Bracteoles free from the perianth. Anthers erect or incurved in bud.

**SERIES I. Cyclolobææ.**—Embryo annular or horseshoe-like; albumen copious (wanting in *Salicornia*).

TRIBE I. **Euchenopodieæ**.—*Stem not jointed. Flowers clustered, all similar. Leaves flat. Stamens perigynous. Embryo usually annular.*

Perianths equally 5 or 4-lobed, herbaceous, not much enlarged in fruit.

- Fruit a small succulent berry . . . . . 1. RHAGODIA.  
Fruit a dry nut enclosed in the perianth . . . . . 2. CHENOPODIUM.

TRIBE II. **Antripliceæ**.—*Stems not jointed. Flowers dimorphic; males ebraacteolate, 3 to 5-lobed or parted; female usually without perianth and enclosed in 2 free or connate bracts. Stamens perigynous. Testa crustaceous or coriaceous; embryo annular.*

Female bracteoles flat, edges united or not . . . . . 3. ATRIPLIX.

TRIBE III. **Chenoleæ**.—*Stem not jointed. Flowers all similar. Utricle included in the usually enlarged perianth. Stamens hypogynous. Seed usually horizontal; testa membranous or coriaceous, adhering to the scanty albumen; embryo annular.*

Fruiting-perianths globular or depressed, membranous, herbaceous or succulent, the lobes horizontally (or rarely conically) closing over the fruit. Seed horizontal or oblique.

Fruiting-perianth membranous or herbaceous, enveloped in wool or long hairs, without any or with horn-like or spinescent dorsal appendages . . . 4. CHENOLEA.

Fruiting-perianth surrounded by 3 to 5 distinct or by 1 continuous annular horizontal wings . . . . . 5. KOCHIA.

Fruiting-perianth without appendages, succulent or coriaceous, glabrous or the lobes slightly pubescent . . . . . 6. ENCHYLENA.

Fruiting-perianth hard, at least at the base, the lobes usually membranous and withering.

Fruiting-perianth with dorsal wings. Flowers solitary. Wings 2 or 3, nearly vertical. Seed horizontal . . . . . 7. BABBAGIA.

Fruiting-perianth without any or with spinescent dorsal appendages.

Fruiting-perianth tomentose or woolly, with 2 opposite diverging dorsal spines rarely wanting. Seed horizontal or oblique . . . . . 8. SCLEROLENA.

Fruiting-perianth glabrous or slightly hairy, with 3 to 5 divaricate dorsal spines. Seed vertical . . . . . 9. ANISACANTHA.

Fruiting-perianth glabrous, without appendages or rarely with 5 small erect spines. Seed horizontal or oblique . . . . . 10. THRELKELDIA.

TRIBE IV. **Salicorniæ**.—*Branches articulate, fleshy. Leaves none. Flowers 2-sexual or hermaphrodite, more or less immersed. Testa various. Embryo curved or folded with little or no albumen.*

Perianth tubular, mouth lacerated. Radicle inferior. Strobili terminal, 1 to 3-ni., scales persistent . . . . . 11. TECTICORNIA.

Perianth ovoid or pyramidal, mouth narrowed, 3 to 4-fid. Seed albuminous.

Testa membranous . . . . . 12. ARTHROCNEMUM.

Seeds without albumen. Testa hispid, hairs hooked . . . . . 13. SALICORNIA.

SERIES II. **Spirolobeæ**.—*Embryo spiral; albumen scanty or wanting.*

TRIBE V. **Suadææ**.—*Utricle enclosed in the simply enlarged perianth. Stem not jointed.*

Perianth small, herbaceous, without appendages. Testa crustaceous.

Embryo coiled in a flat spire . . . . . 14. SUEDA.

TRIBE VI. **Salsolæ**.—*Utricle enclosed in the transversely-winged perianth. Stem jointed or not.*

Perianth rigid, with dorsal horizontal wings. Testa membranous. Embryo coiled in a conical or biconvex spire. (Leaves and bracts pungent). . . 15. SALSOLA.

SUBORDER II. **Baselleæ**.—*Stem twining. Bracteoles 2 broad, adnate to the face of the perianth. Filaments straight or curved in bud.*

TRIBE VII. **Boussingaultiæ**.—*Stamens reflexed in bud. Embryo semi-annular, albumen farinose.*

Bracteoles oblong, obtuse, shorter than the perianth . . . . . 16. \*BOUSSINGAULTIA.

## 1. RHAGODIA, R. Br.

(Fruit berry-like).

Flowers polygamous, mostly hermaphrodite or female, but sometimes almost diœcious. Perianth deeply 5-cleft, the lobes or segments obtuse, concave, scarcely enlarged in fruit, and either closing over the fruit or expanded under it. Stamens 5 or fewer, filaments more or less flattened. Ovary globular or nearly

so. Styles 2 or very rarely 3, shortly subulate, very shortly united at the base. Fruit a small depressed-globular berry. Seed flattened, horizontal; testa crustaceous. Embryo circular, enclosing a mealy albumen.—Shrubs undershrubs or rarely herbs. Leaves alternate or some or nearly all opposite, flat, entire. Flowers small, sessile or very rarely pedicellate, in clusters or rarely solitary, in interrupted terminal spikes or panicles, without bracts. Perianth tomentose outside, glabrous inside.

The genus is exclusively Australian, differing from *Chenopodium* in the succulent pericarp and usually in the more shrubby habit. The species are often very variable in stature and ligae and very difficult to mark out by positive characters.

Panicle usually much branched.

Flowers polygamous.

Leaves almost all alternate, mostly narrow and green above, paler or whiter underneath than above, the margins often recurved . . . . . 1. *R. Billardieri*.

Leaves alternate or opposite, mostly broad, flat, green or white on both sides . . . . . 2. *R. parabolica*.

Inflorescence nearly single or panicle not much branched.

Fruiting-perianth 1 to  $1\frac{1}{2}$  line diameter and usually not broader than the fruit. Leaves thick, rarely above  $\frac{1}{2}$  in. long, linear cuneate or rarely obovate . . . . . 3. *R. crassifolia*.

Leaves flat, rather thin, mostly alternate broad and small. Plant spinescent . . . . . 4. *R. spinescens*.

Leaves thin, green, opposite or alternate. Plant usually slender or weak.

Leaves mostly opposite, ovate or hastate, very obtuse . . . . . 5. *R. hastata*.

Leaves mostly opposite, lanceolate or broad, all acute . . . . . 6. *R. nutans*.

Leaves alternate, linear . . . . . 7. *R. linifolia*.

1. **R. Billardieri** (after J. J. Labillardiere), *R. Br. Prod.* 408; *Benth. Fl. Austr.* v. 152. A shrub either straggling or diffuse, or erect and attaining 5 or 6 ft., the foliage and young shoots somewhat fleshy, rarely quite green, but usually with less of the mealy tomentum than most species, except on the inflorescence. Leaves alternate or rarely here and there opposite or nearly so, usually oblong-lanceolate or linear-oblong, but varying to quite linear or when small to ovate or broadly hastate, always obtuse, contracted into a short petiole, from scarcely  $\frac{1}{2}$  in. to above 1 in. long, usually green above when full grown and pale or whitish underneath, the margins often recurved and never incurved. Panicle terminal, usually much branched and  $1\frac{1}{2}$  to 2 in. long, the branches rather slender and divaricate, the flowers small, polygamous, in distant clusters. Perianth about 1 line diameter, or when fully expanded under the fruit attaining  $1\frac{1}{2}$  line, lobed to about the middle. Berry when fully ripe as broad as or broader than the expanded perianth.—F. v. M. Ic. Sal. Pl. 21. *Chenopodium baccatum*, Labill. Pl. Nov. Holl. i. 71, t. 96; *Rhagodia baccata*, Moq. in DC. Prod. xiii. ii. 50; Hook. f. Fl. Tasm. i. 312; *R. Candolleana*, Moq. Chenop. Enum. 10 (with small broad leaves approaching the var. *congesta*.)

Hab.: Inland southern downs country.

2. **R. parabolica** (parabolic), *R. Br. Prod.* 408; *Benth. Fl. Austr.* v. 153. An erect shrub, attaining sometimes 8 or 10 ft., but often much lower, mealy-white all over or in the more slender specimens the adult leaves green. Leaves opposite or alternate, on rather long petioles, broadly ovate obovate or almost rhomboidal, usually rounded at the end and obtuse or shortly mucronate, contracted or rarely obtusely hastate at the base, rarely exceeding 1 in. and often under  $\frac{1}{2}$  in. long. Flowers, as in *R. Billardieri*, polygamous, in distinct clusters along the divaricate branches of a terminal panicle, sometimes very dense and crowded, sometimes loose and slender. Perianth mealy-tomentose and sometimes densely so, the lobes ovate, obtuse, more united at the base than in most species, expanding to above 1 line diameter, but the succulent ripe fruit still larger. Seed about 1 line

diameter.—Schlecht. in *Linnaea*, xx, 574; Moq. in DC. Prod. xiii. ii. 51; *R. reclinata*, A. Cunn., Herb.; Moq. l.c. 51 (with the leaves less white than in the typical form.)

Hab.: In the interior, *Mitchell*, *Bowman*; *Armadilla*, *W. Barton*; *Curriwillinghamie*, *Dalton*; between *Burnett* and *Dawson Rivers*, *F. v. Mueller*; and many other inland localities.

Scarcely more than a variety of *R. Billardieri*.

3. ***R. crassifolia*** (leaves thick), *R. Br. Prod.* 408; *Benth. Fl. Austr.* v. 154. A dwarf or diffuse much branched scrubby shrub, or the branches somewhat elongated in narrow-leaved forms, nearly green or more or less hoary-tomentose. Leaves mostly alternate, linear or scarcely oblong in the typical form, rarely cuneate or almost obovate in some varieties, obtuse, contracted into a short petiole, rather thick, flat or concave, rarely  $\frac{1}{2}$  in. long. Flowers and fruits small, clustered or rarely solitary, in short terminal nearly simple interrupted spikes or slightly branched panicles. Fruiting perianth not exceeding the red or lilac fruit.

Hab.: Recorded for Queensland by *F. v. M.*

4. ***R. spinescens*** (spiny), *R. Br. Prod.* 408; *Benth. Fl. Austr.* v. 155. A divaricately branched rather slender shrub, usually low and straggling or prostrate, sometimes more erect and bushy and attaining several feet, mealy-white or at length nearly glabrous, the smaller branchlets often (but not always) terminating in slender spines. Leaves mostly alternate, obovate ovate orbicular or deltoid, in some specimens nearly  $\frac{1}{2}$  in. long, rather narrow, thin and but slightly mealy, in others all under  $\frac{1}{2}$  in. broad, rather thick and very mealy-white, with many intermediate states, always flat or concave. Flowers small, polygamous, in small clusters or almost solitary in short terminal interrupted spikes or panicles, or almost solitary in the upper axils. Fruit sometimes yellow, small ( $1\frac{1}{4}$  line diameter when dry), the perianth expanded under it but not projecting beyond.—Moq. in DC. Prod. xiii. ii. 53; *F. v. M. l.c. Sal. Pl.* 22.

Hab.: *Burdekin River*, *F. v. Mueller*; near *Rockhampton*, rare, *O'Shanesey*; *Armadilla*, *W. Barton*.

5. ***R. hastata*** (hastate), *R. Br. Prod.* 408; *Benth. Fl. Austr.* v. 156. A procumbent or divaricately branched undershrub, spreading to 2 or 3 ft., green or slightly mealy-white when young. Leaves opposite or rarely alternate, petiolate, ovate-hastate or almost rhomboidal, very obtuse or emarginate, the basal lobes short obtuse or rarely acute, under 1 in. and often under  $\frac{1}{2}$  in. long. Flowers small, clustered, usually in compact simple or slightly branched spikes, either terminal or in the upper axils and shorter than the leaves, rarely more slender and elongate. Perianth-divisions oblong, not contracted at the base or stipitate as in *Chenopodium triangulare*, which this species sometimes resembles. Fruit  $\frac{1}{2}$  to  $\frac{3}{4}$  line diameter, usually red.—Moq. in DC. Prod. xiii. ii. 53; *F. v. M. l.c. Sal. Pl.* 25.

Hab.: *Rockhampton*, *Dallachy* and others; *Nerkool Creek*, *Bowman*; *Moreton Bay*, *Leichhardt*, *C. Stuart*. Not uncommon in southern localities.

6. ***R. nutans*** (nodding), *R. Br. Prod.* 408; *Benth. Fl. Austr.* v. 156. Herbaceous, prostrate or procumbent and slender, often extending to 1 to 2 ft., green or the young foliage more or less mealy-white, the stems rarely almost woody at the base. Leaves opposite or here and there alternate, on rather slender petioles, from broadly hastate with very prominent basal lobes to lanceolate and angular only at the base, always acute, rather thin and green, rarely 1 in. long and often all under  $\frac{1}{2}$  in., the upper ones gradually smaller. Inflorescence simple or with a few short branches, terminal or in the upper axils, under 1 in. long or rarely elongated, sometimes nodding at the end, sometimes slightly leafy at the base, with one or two solitary flowers or small clusters



in the axils of the upper leaves. Flowers very small, the males with 2 or 3 stamens and a rudimentary pistil, the females without any or with only 1 stamen. Fruit about  $\frac{1}{2}$  line diameter, the pericarp red and succulent when fresh, thin when dry.—Moq. in DC. Prod. xiii. ii. 53; Hook. f. Fl. Tasm. i. 312; F. v. M. Ic. Sal. Pl. 24.

Hab.: Brisbane River, *F. v. Mueller*; Curriwillinghamie, *Dalton*. Not uncommon in southern localities.

**7. R. linifolia** (Linum-leaved), *R. Br. Prod.* 408; *Benth. Fl. Austr.* v. 157. A diffuse or procumbent herb or undershrub, more slender even than *R. nutans* and like that species green or the young shoots very slightly mealy. Leaves alternate, linear or linear-lanceolate, rather acute, contracted into a short petiole, thin and green on both sides, from under  $\frac{1}{2}$  in. to nearly 2 in. long. Inflorescence almost filiform, rarely above 1 in. long, simple or slightly branched or forming a slender divaricate leafy panicle. Flowers very small, solitary or in small clusters, the females mostly pedicellate. Perianth glabrous. Fruit smaller than in any other species, the pericarp red and pulpy when fresh, thin when dry. Moq. in DC. Prod. xiii. ii. 49; F. v. M. Ic. Sal. Pl. 23.

Hab.: Broadsound, *R. Brown*; Bay of Inlets, *Banks and Solander*; in the interior, *Mitchell*; Curriwillinghamie, *Dalton*; Darling Downs, *Lau*; Rockhampton, *O'Shanesy*. Not uncommon.

## 2. CHENOPODIUM, Linn.

(From *chen*, a goose, and *pous*, a foot; in allusion to shape of leaves.)

(*Ambrina*, *Moq.*, *Blitum*, *Moq.* (partly).)

Flowers hermaphrodite or rarely polygamous. Perianth herbaceous, deeply divided into 5 or rarely 4 or 3 lobes or segments which are obtuse and concave or rarely acute and erect, scarcely altered or slightly enlarged after flowering. Stamens 5 or fewer, filaments filiform or flattened. Ovary globular or ovoid; styles 2 or rarely 3, usually united at the base. Fruit depressed or ovoid, partially or completely covered by the persistent perianth, pericarp dry, membranous, distinct from or inseparable from the seed. Seed horizontally flattened or vertical and less compressed; testa crustaceous; embryo circular, enclosing a mealy albumen.—Herbs or rarely shrubs or undershrubs. Leaves alternate, flat, entire toothed or divided. Flowers small, sessile in clusters, either axillary or in interrupted terminal spikes or panicles.

The genus is widely distributed over the globe, but appears to be really indigenous chiefly in temperate and subtropical regions.

**SECT. 1. Rhagodioides.**—*Spinescent shrub. Flower-clusters in terminal spikes. Seeds vertical.*

Plant hoary or mealy-white. Leaves entire . . . . . 1. *C. nitriaceum*

**SECT. 2. Chenopodiastrium.**—*Herbs mealy-white or glabrous. Flower-clusters in terminal or axillary spikes or panicles. Seeds all or mostly horizontal.*

Erect and mealy-white or almost glabrous. Spikes terminal, often paniculate.

Leaves (usually very hoary or white) entire or very rarely hastate . . . 2. *C. auricomum*.

Leaves (green or mealy-white underneath or on both sides) at least the lower ones coarsely sinuate-toothed . . . . . 3. *C. album*.

Erect green annual. Cymes or panicles axillary and loose.

Leaves broad, coarsely toothed . . . . . 4. *C. murale*.

Stems weak and elongated. Leaves entire or hastate, green or scarcely mealy. Flower-clusters in terminal interrupted spikes. Stamen usually 1 . . . 5. *C. triangulare*.

**SECT. 3. Botryois.**—*Erect glandular aromatic herbs or undershrubs not mealy. Seeds all or mostly horizontal.*

Leaves narrow, mostly sinuate-toothed. Flower-clusters axillary, forming a leafy panicle . . . . . 6. *C. ambrosioides*.

SECT. 4. **Orthosporum**.—Decumbent glandular herbs not mealy. Seeds all vertical. Flower-clusters all axillary.

- Perianth-segments broad concave with a thickened keel . . . . . 7. *C. carinatum*.  
 Perianth-segments linear, erect, the keel dilated into a broad fringed wing or crest . . . . . 8. *C. cristatum*.  
 Perianth-segments somewhat scarious, inflated, angular and pointed, valvate 9. *C. simulans*.

1. **C. nitrariaceum** (in allusion to its salty nature), *F. v. M.*; *Benth. Fl. Austr.* v. 158. A rigid divaricately branched or prostrate shrub or undershrub, hoary or mealy-white all over with a minute tomentum, the smaller branchlets often spinescent but not nearly so slender as in *Rhagodia spinescens*. Leaves alternate, sometimes clustered at the base of the flowering branchlets, linear oblong, or linear-spathulate, very obtuse, entire, contracted into a short petiole, from under  $\frac{1}{2}$  in. to nearly 1 in. long. Flowers sessile, usually clustered in interrupted or dense spikes, either simple and terminal or forming short divaricate branches to a terminal panicle, mostly hermaphrodite with a few males intermixed. Perianth-segments broad, thick, concave, slightly imbricate in the bud. Stamens 5, shortly exserted, the filaments flat and glabrous. Ovary ovoid, erect, the styles short, rather thick, united at the base. Fruit enclosed in the unaltered perianth. Pericarp membranous. Seed erect, flat; embryo circinate, the radicle usually inferior.—*F. v. M. Ic. Sal. Pl.* 28; *Rhagodia nitrariacea*, *F. v. M.* in *Trans. Phil. Inst. Vict.* ii. 73.

Hab.: Recorded for Queensland by *F. v. M.*

2. **C. auricomum** (golden-haired), *Lindl. in Mitch. Trop. Austr.* 94; *Benth. Fl. Austr.* v. 159; Blue Bush. Erect and tall, more or less white or hoary all over, herbaceous and not spinescent. Leaves on rather long petioles, ovate or oblong, very obtuse, entire or rarely hastate with prominent basal lobes, mostly  $\frac{3}{4}$  to  $1\frac{1}{4}$  in. long. Flowers in little dense globular clusters along the branches of a terminal panicle, sometimes distinct and rather distant, sometimes crowded into dense spikes. Perianth-segments broad, concave, closing over the fruit. Stamens 5, shortly exserted. Ovary small, globular, contracted into a long neck or united base of the styles. Pericarp depressed-globose, membranous. Seed very flat, horizontal. Embryo annular.—*Moq. in DC. Prod.* xiii. ii. 460; *F. v. M. Ic. Sal. Pl.* 29.

Hab.: Gulf of Carpentaria, *Laudsborough*; Narran River, *Mitchell*; Curriwillingham, *Dalton*; Suttor and Bowen Rivers, *Bowman*; common inland.

This species undoubtedly comes near to some forms of *C. album*, differing in its entire more tomentose leaves and larger flowers. It appears to be still more closely allied to and perhaps not really distinct from the East Asiatic *C. acuminatum*, Willd.—*Benth.*

3. **C. album** (white), *Linn.*; *Moq. in DC. Prod.* xiii. ii. 70; *Benth. Fl. Austr.* v. 159; Fat Hen. A tough annual usually erect, 1 to 2 ft. high, of a pale green or more or less mealy-white, especially the flowers and the under side of the leaves. Leaves petiolate, the lower ones ovate or rhomboidal, more or less sinuate-toothed or angular, the upper ones usually narrow and entire. Clusters of flowers in short dense or interrupted spikes, simple or slightly branched, the lower ones axillary, the upper ones or sometimes nearly all in a long terminal panicle leafy at the base. Segments of the fruiting perianth broad, concave, somewhat thicker in the centre or keeled, contracted and united at the base, completely closing over the fruit. Stamens usually 5. Seeds all horizontally flattened, smooth and shining, the pericarp exceedingly thin.—*C. lanceolatum*, *R. Br. Prod.* 407; *Moq. in DC. Prod.* xiii. ii. 62; *C. Browneanum*, *Roem. and Schult. Syst.* vi. 275.

Hab.: Nerkool Creek, *Bowman*; Armadilla, *W. Barton*; Warwick, *Beckler*.

The species is a very common weed in Europe and temperate Asia, and has spread as such over many other parts of the world. Whether indigenous or introduced uncertain.

4. **C. murale** (of walls), *Linn.*; *Moq. in DC. Prod.* xiii. ii. 69; *Benth. Fl. Austr.* v. 160. A rather stout erect or decumbent much branched annual, from under 1ft. to nearly 2ft. high, usually green, but sometimes with a slight whitish meal on the young shoots. Leaves on long petioles, broadly ovate triangular or rhomboidal, deeply and irregularly toothed, 1 to above 2in. long. Flowers small, green or slightly mealy, the clusters in much-branched rather slender spikes, forming loose leafless cymes or panicles usually much shorter than or rarely as long as the leaves, almost all axillary, rarely lateral or terminal. Segments of the fruiting perianth broad, concave, somewhat keeled, closing over the fruit or nearly so. Stamens usually 5. Seeds all horizontally flattened, opaque or somewhat rugose, the margins thick and obtuse or thin and acute. Pericarp not readily separable from the seed. *C. croston*, *R. Br. Prod.* 407; *Moq. in DC. Prod.* xiii. ii. 68; *Hook. f. Fl. Tasm.* i. 313.

Hab.: Rockhampton, rare; Brisbane and other towns.

This is another European weed now widely dispersed over various temperate and warm regions of the globe. Whether indigenous or introduced uncertain.

5. **C. triangulare** (triangular), *R. Br. Prod.* 407; *Benth. Fl. Austr.* v. 160. Stems weak procumbent or straggling, extending sometimes to 2ft. or more, the whole plant green or with but little of white meal on the young shoots. Leaves on rather long petioles, from ovate to oblong or to broadly hastate in the typical form, obtuse or shortly mucronate, under 1in. long, the upper ones often and sometimes all lanceolate. Flowers very small, in clusters or little cymes in a terminal interrupted spike or along the short distant branches of a slender terminal panicle, or the lower ones in the axils of the upper leaves. Perianth-segments broad and concave, sometimes closing over and covering the fruit, sometimes smaller and much contracted at the base. Stamen usually 1. Styles short. Seed flat, horizontal, about  $\frac{1}{2}$  line diameter, in a very thin membranous pericarp.—*F. v. M. Ic. Sal. Pl.* 26; *C. trigonon*, *Roem. and Schult. Syst.* vi. 275; *Moq. in DC. Prod.* xiii. ii. 65.

Hab.: Common in many localities.

Var. *stellulatum*. Perianth-segments with a rather small concave lamina contracted at the base into a linear stipes (reduced to the somewhat prominent midrib). Leaves of the typical form.—Wallangarra, border of N.S.W.

Var. *angustifolium*. Leaves linear-lanceolate or the lower ones lanceolate-hastate. Perianth of the typical form.—The common form in Queensland.

6. **C. ambrosioides** (Ambrosia-like), *Linn.*; *Moq. in DC. Prod.* xiii. ii. 72; *Benth. Fl. Austr.* v. 162. An erect much-branched annual of 1 to 2ft., not mealy but more or less glandular-dotted and strongly aromatic. Leaves lanceolate or oblong, acute or obtuse, the lower ones irregularly toothed or sinuate, contracted into a short petiole, from under 1in. to above 2in. long, the upper ones smaller and entire, passing into small linear or linear-lanceolate acute petiolate bracts, all green on both sides, glandular underneath. Flowers very small and numerous, solitary or clustered in the axils of bracts which are either minute or leafy and longer than the clusters, the clusters forming more or less leafy slender interrupted spikes, arranged in a large leafy panicle occupying the greater part of the plant. Fruiting perianth about  $\frac{1}{2}$  line diameter, the lobes short, completely or almost completely covering the fruit. Seeds smooth and shining, all or almost horizontal.

Hab.: Moreton Bay, *F. v. Mueller*; Rockhampton, *O'Shanesy*. Common. Whether indigenous or introduced uncertain.

A common weed in southern Europe, northern Africa, and western Asia, and spread with cultivation over many parts of the World.

7. **C. carinatum** (keeled), *R. Br. Prod.* 407; *Benth. Fl. Austr.* v. 162. Stems much-branched and procumbent or prostrate at the base, ascending to from  $\frac{1}{2}$  to 1ft. or more, the whole plant more or less glandular pubescent. Leaves on

long petioles, ovate or oblong, obtuse, coarsely sinuate toothed, usually rather thick and rugose, glandular-scabrous on both sides,  $\frac{1}{2}$  to 1 in. long, the upper floral ones often much reduced, and sometimes all the leaves almost orbicular and small. Flowers small, in dense globular clusters in almost all the axils, the upper ones sometimes forming interrupted more or less leafy spikes. Perianth-segments erect, incurved, broadly oblong, concave and almost boat-shaped, with a thickened broad obtuse keel, more or less pubescent or hirsute. Stamen usually 1. Fruit small, ovoid, erect, the pericarp inseparable from the seed.—*F. v. M. Ic. Sal. Pl.* 32.; *Salsola carinata*, Spreng. Syst. i. 923; *Ambrina carinata*, Moq. *Chenop. Enum.* 41; *Blitum carinatum* and *B. glandulosum*, Moq. in *DC. Prod.* xii. ii. 81, 82; *Chenopodium glandulosum*, *F. Muell. Fragm.* vii. 11.

Hab.: Moreton Bay, *W. Hill* and others; Peak Downs, *F. v. M.*; Rockhampton, *O'Shanesy*; Armadilla, *W. Barton*.

8. **C. cristatum** (crested), *F. v. M. Fragm.* vii. 11; *Benth. Fl. Austr.* v. 163. Diffuse or procumbent, with ascending flowering branches of 1 ft. or more, the whole plant slightly glandular-pubescent. Leaves on long petioles, from ovate to oblong-lanceolate, obtuse, coarsely toothed, narrowed at the base,  $\frac{1}{2}$  to 1 in. long, green and glandular-scabrous on both sides. Flowers in dense globular clusters, all axillary. Perianth-segments linear, erect, not incurved, acute, about 1 line long when in fruit, the keel dilated into a broad fringed crest or wing. Fruit ovoid, erect, enclosed in the perianth. Styles very slender.—*Blitum cristatum*, *F. v. M.* in *Trans. Phil. Inst. Vict.* ii. 73; *Sal. Pl.* 31.; *F. v. M. Ic.*

Hab.: Southern localities.

9. **C. simulans** (resembling), *F. v. M. Cens. Austr. Plants.* An erect plant, stemless or very short stems or branches from the root, densely beset with short glandular hairs; leaves conspicuously stalked, ovate-oblong, cuneate at the base, wavy at the margin or bluntly short-lobed. Flowers in elongated leafless, dense, simple spikes. Perianth-segments 3, somewhat scarious, inflated, prominently angular in front and at the margin, pointed at the summit, closing valvately over the fruit, the lateral angles membranous, not fringed; tube semi-ovate, papillular; stigmas 2, subtle-capillary. Fruit spherical, pale brown, smooth, translucent; embryo nearly semicircular.—*Dysphania simulans*, *F. v. M.* et *Tate*, in *Trans. Roy. Soc. South Austr.* viii. 71; *F. v. M. Ic. Sal. Pl.* 34.

Hab.: Queensland, locality not stated, *F. v. M.*

### 3. ATRIPLEX, Linn.

(From *a*, not, and *traphein*, to nourish).

(Obione and Theleophyton, *Moq.*)

Flowers unequal. Male perianth nearly globular, deeply divided into 5, rarely fewer segments. Stamens 5 or fewer. Female perianth very small at the time of flowering, 2-toothed or 2-lobed, enclosing the ovary. Styles 2, free or united at the base. Fruiting perianth much enlarged and variously shaped, the tube very small or large, flat or variously thickened, the limb of 2 variously shaped segments or valves closely appressed, at least at the margin (except in *A. campanulata*), entire or toothed. Fruit entirely enclosed in the tube or between the valves. Pericarp membranous, very thin. Seed compressed, vertical; testa crustaceous, often thin with a very thin inner integument sometimes scarcely distinct. Embryo surrounding a mealy albumen, the radicle superior lateral or inferior.—Herbs or shrubs, more or less mealy or scaly-tomentose. Leaves alternate or the lower ones rarely opposite, flat, entire hastate or sinuate-toothed. Male flowers in globular clusters, either detached from the females in close or interrupted simple or paniculate spikes, or axillary and then each cluster usually

surrounded by females; female flowers usually in axillary clusters, rarely solitary or the clusters in terminal leafless panicles. Bracts subtending the male as well as the female flowers usually minute, or quite obsolete.

The genus is widely distributed over most parts of the globe, chiefly in maritime or subsaline districts, some species also frequenting rich cultivated grounds.

A few modern botanists have, after Pliny, treated the name *Atriplex* as of the neuter instead of the feminine gender. As there is classical authority for both, I have preferred following Linnæus, De Candolle and the great majority of botanists in treating it as feminine.—*Benth.*

**SERIES I. *Paniculatæ*.**—*Diœcious or semidiœcious scaly tomentose shrubs, the male clusters in more or less branched paniculate dense or interrupted leafless spikes.*

- Diœcious, both sexes paniculate. Fruiting perianths flat, reniform, on a slender stipes. Spikes in male panicles interrupted . . . . . 1. *A. stipitata*.  
 Fruiting perianth expanding into a reniform netted entire wing . . . . . 2. *A. Quinii*.  
 Fruiting perianths with thick convex valves. Leaves mostly orbicular,  $\frac{1}{2}$  to lin. Female inflorescence more simple and leafy . . . . . 3. *A. nummularia*.  
 Semi-diœcious. Female flowers solitary or very few in the axils of the stem-leaves of the male plants, more clustered but all axillary in the females. Leaves mostly oblong. Fruiting perianths broadly triangular or rhomboid, flat or thickened over the fruit, with a turbinate solid base . . . . . 4. *A. cinerea*.

**SERIES II. *Vesicariæ*.**—*Small bushy or decumbent more or less scaly tomentose shrubs, diœcious or monœcious. Male flowers in short terminal dense spikes, females axillary. Fruiting perianth orbicular, membranous, with large membranous appendages on each face.*

- Leaves obovate or oblong lanceolate, usually white, 4 to 8 lines long.  
 Mostly monœcious . . . . . 5. *A. vesicaria*.

**SERIES III. *Oleracæ*.**—*Monœcious annuals usually tall or spreading, green or slightly mealy. Flowers clustered in the axils and in terminal panicles. Valves of the fruiting perianth flat or muricate.*

- Erect and 2 or 3ft., or spreading or procumbent. Leaves narrow except the lower ones. Flowers usually in distant clusters.  
 Fruiting perianth thickened at the base, the valves united to near the middle . . . . . 6. *A. patula*.

**SERIES IV. *Glomeratæ*.**—*Monœcious decumbent procumbent or spreading herbs, scaly-tomentose or very rarely green. Male flowers in globular clusters surrounded by a few females in the upper axils or rarely forming a short terminal spike, females clustered in the lower axils without males. Fruiting perianths more or less compressed, conspicuously 2-valved.*

- Fruiting perianth with a small turbinate solid base, flat, rhomboidal, the valves free almost or quite to the base, closing over the fruit.  
 Leaves narrow, entire. Male flowers in short terminal compact spikes. 7. *A. humilis*.  
 Fruiting perianth with a compressed turbinate base half enclosing the fruit, shorter than or not longer than the valves.  
 Leaves nearly orbicular, about lin. diameter. Fruiting perianth stipitate, the valves more than twice as broad as the tube . . . . . 8. *A. angulata*.  
 Leaves narrow, usually green,  $\frac{1}{2}$  to lin. long. Fruiting perianth sessile, rhomboidal, the valves not broader than the tube . . . . . 9. *A. semibaccata*.  
 Fruiting perianth with a globular ovoid or slightly compressed tube enclosing the fruit, the valves shorter than the tube.  
 Spreading (or erect?) Leaves broad, mostly toothed and 2in. long or more. Fruiting perianth 1 to 1½ line diameter . . . . . 10. *A. Muelleri*.  
 Fruiting perianth with an obliquely campanulate slightly compressed tube with appendages on the shorter face. Valves toothed, unequal and scarcely appressed . . . . . 11. *A. campanulata*.  
 Fruiting perianth lacinate, the females more so than the males . . . . . 12. *A. fissivalvis*.

**SERIES V. *Parviloba*.**—*Monœcious spreading or procumbent herbs or undershrubs scaly-tomentose or mealy. Inflorescence of the *Glomeratæ*. Fruiting perianths not compressed, enclosing the fruit, the orifice small closed by small erect appressed valves.*

- Fruiting perianth cylindrical, narrow.  
 Valves of the fruiting perianth minute, entire, without appendages . . . . . 13. *A. leptocarpa*.  
 Valves 2-horned with a minute central lobe and a dorsal appendage between the horns . . . . . 14. *A. limbata*.  
 Fruiting perianth inflated and spongy.  
 Fruiting perianth hemispherical or turbinate with an almost flat top and acute or winged margin. Radicle lateral or almost inferior . . . . . 15. *A. halimoides*.

- Fruiting perianth turbinate-globular, 4 to 6 lines diameter. Radicle superior. . . . . 16. *A. holocarpa*.  
 Fruiting perianth depressed-globular, not 2 lines diameter. Radicle superior. . . . . 17. *A. spongiosa*.

1. **A. stipitata** (stipitate), *Benth. Fl. Austr.* v. 168. An erect bushy rather slender shrub, scaly white or somewhat fulvous all over. Leaves from obovate to narrow-oblong, very obtuse, entire, contracted into a short petiole, mostly rather thick,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Flowers diœcious, the males numerous in little globular clusters scarcely 2 lines diameter, all distinct and somewhat distant, in slightly branched terminal panicles or almost simple spikes; females in smaller clusters, the lower ones often solitary in the axils, the upper ones in a somewhat leafy spike or panicle, some of them sessile ovoid or globular shortly 2-lobed, enclosing an apparently perfect ovary but soon falling off, the greater number more or less stipitate at a very early age with broad flat valves. Fruiting perianth on a slender stipes of 2 to 4 lines, with a small campanulate tube half enclosing the fruit; valves flat, reniform, entire, 4 to 5 lines broad. Seed orbicular, flat, the radicle superior.—*F. v. M. Ic. Sal. Pl.* 13; *A. reniformis*, *F. v. M. Fragn.* vii. 9, as to the eastern stations, not of R. Br.

Hab.: Southern localities.

2. **A. Quinnii** (after Edward Quinn), *F. v. M., Vict. Nat.* v. 96. Plant slightly shrubby, comparatively dwarf, grey from minute appressed scales. Leaves from rhomboid to linear-lanceolate, almost or quite entire. Male flowers mostly in clusters at the ends of the branchlets; female flowers mostly lower down, few or 2 together or some singly scattered, their stalks finally conspicuous, hemi-ellipsoid-cylindric; the two segments of the involucre renate or somewhat verging into a rhomboid form, entire or distantly toothed, upwards rather membranous, at their base bearing a small but prominent and quite renate appendage. Fruit at the base of the involucre segments close to the stalk. Radicle ascending.—*F. v. M. Ic. Sal. Pl.* 12.

Hab.: Given as a Queensland plant in *Muell. 2nd Syst. Cens. Austr. Pl.* 50.

3. **A. nummularia** (shaped like a coin), *Lindl. in. Mitch. Trop. Austr.* 64; *Benth. Fl. Austr.* v. 170. Old Man Salt Bush. An erect shrub, attaining several ft., with spreading branches, the whole plant covered with a scaly tomentum. Leaves on rather long petioles, mostly orbicular, rather thick, entire or scarcely sinuate-toothed, more rarely bordered by numerous small teeth,  $\frac{1}{2}$  to 1 in. diameter, or on some luxuriant branches nearly 2 in. Flowers diœcious, the male clusters forming dense oblong or shortly cylindrical spikes, in more or less branched terminal panicles, either leafless or sparingly leafy at the base, the females also clustered in dense terminal rather more leafy spikes or panicles, with a few flowers also in the axils of the upper stem-leaves. Fruiting perianth sessile, from ovate to orbicular, 2 to 3 lines long, rounded or truncate, not cordate at the base, the valves free nearly to the base, thickened and hardened over the fruit at the base, the remainder flat and herbaceous, entire or toothed on each side towards the base. Radicle superior.—*Moq. in DC. Prod.* xiii. ii. 460; *F. v. M. Ic. Sal. Pl.* 16.

Hab.: Darling Downs and many other inland localities..

Sometimes on the fruit of this species is found the fungus, *Camarosporium punctiforme*, Ck. and Mass.

4. **A. cinerea** (grey), *Poir. Dict. Suppl.* i. 471; *Benth. Fl. Austr.* v. 171. A branching shrub, sometimes low or slightly decumbent, more frequently erect and attaining several feet, white or ashy grey all over with a scaly tomentum. Leaves oblong or lanceolate, rarely almost ovate, obtuse, entire, contracted into a short petiole, mostly 1 to 2 in. long, but in some specimens scarcely exceeding 1 in. or

smaller. Flowers semidiœcious, the males in dense globular clusters of 2 to 4 lines diameter collected into a terminal spike either short and interrupted at the base or 2 or 3 in. long with a few short densely oblong or cylindrical branches, the flowers often not quite sessile in the clusters. Female flowers in axillary clusters on the female plants, and also 1 or 2 female flowers in the axils of the upper stem-leaves of the male plants. Fruiting perianths with an obovoid or turbinate solid base, 1 to nearly 2 lines long, the valves broadly triangular or rhomboidal, from under 3 lines to above 4 lines diameter, free almost from the base, entire, flat or thickened over the fruit, smooth or rarely with 1 or 2 tubercles on the disk. Fruit at the base of the valves. Radicle ascending.—Moq. in DC. Prod. xiii. ii. 101; Hook. f. Fl. Tasm. i. 314; F. v. M. Ic. Sal. Pl. 15; *A. halimus*, R. Br. Prod. 406, not of Linn.; *A. halimus*,  $\beta$  *ascendens* Nees in Pl. Preiss. i. 633; *A. elæagnoides*, Moq. Enum. Chenop. 65.

Hab.: Moreton Bay, *A. Cunningham*.

5. ***A. vesicaria*** (bladdery), *Heward*, MS.; *Benth. Fl. Austr.* v. 172. A bushy shrub, apparently erect, covered with a scaly tomentum. Leaves oblong-oblong-lanceolate or rarely almost obovate, obtuse or almost acute, entire, contracted into a short petiole, from under  $\frac{1}{2}$  in. to about  $\frac{3}{4}$  in. long. Flowers monœcious (or sometimes diœcious?), the males in small clusters forming rather dense terminal leafless spikes of  $\frac{1}{2}$  to 1 in.; females few together in axillary clusters. Fruiting perianth nearly orbicular, 3 to 5 lines diameter, the valves membranous, very shortly connate, very obtuse or obscurely acuminate, the margins entire, flat but each with a membranous inflated appendage on the disk nearly as large as the valve itself. Seeds rather large, compressed; radicle lateral.—F. v. M. Ic. Sal. Pl. 18.

Hab.: The Barcoo, Diamantina and many other inland localities.

6. ***A. patula*** (slightly spreading); *Linn.*; *Moq. in DC. Prod.* xiii. ii. 95; *Benth. Fl. Austr.* v. 173. An erect spreading or prostrate annual, usually 1 to 2 ft. long, either quite green or somewhat mealy-white, never so thickly scaly as most species. Leaves petiolate, the lower ones usually lanceolate-hastate, coarsely toothed or somewhat lobed, often 3 in. long or more, the upper ones lanceolate and entire. Flowers clustered in slender interrupted spikes forming narrow terminal panicles leafy at the base, the upper floral leaves reduced to small bracts, the female flowers mixed with the males or a few in separate axillary clusters. Fruiting perianths ovate or rhomboidal, usually acute, the valves united to near the middle, entire or toothed, smooth or muricate on the disk, very variable in size and shape but usually under 2 lines diameter.—Radicle lateral or ascending.—Hook. f. Fl. Tasm. i. 314; *A. australasica*, Moq. in DC. Prod. xiii. ii. 96.

Hab.: Islands of Moreton Bay, *F. v. Mueller*.

The species is very common in Europe and a great part of Asia, including several described as distinct by Moquin, and is probably only of modern introduction into Australia.—*Benth.*

7. ***A. humilis*** (low), *F. v. M. Fragm.* iv. 48; *Benth. Fl. Austr.* v. 174. Stems hard and more or less decumbent at the base, ascending to about 1 ft., the branches and foliage mealy or minutely scaly-tomentose. Leaves nearly sessile, mostly lanceolate or oblong-linear, obtuse, entire, contracted at the base, rarely above  $\frac{1}{2}$  in. long, the lower ones longer. Flowers monœcious, the males in compact sessile terminal spikes of  $\frac{1}{4}$  to  $\frac{1}{2}$  in., the females all axillary and densely clustered. Fruiting perianths broadly rhomboid,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  lines diameter, with a small thick turbinate solid base, the valves entire, free almost to the base, herbaceous and reticulate. Seeds orbicular; radicle superior.—F. v. M. Ic. Sal. Pl. 9.

Hab.: Subsaline banks of Flinders River, Gulf of Carpentaria, *F. v. Mueller*.

8. **A. angulata** (angular), *Benth. Fl. Austr.* v. 174. Mealy or almost scaly-tomentose and probably herbaceous. Leaves on long petioles which are winged below the lamina, orbicular or broadly rhomboid, very obtuse, angular or sinuate,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. diameter. Flowers monœcious, the male clusters in the upper axils accompanied by a few females or 2 or 3 forming a short terminal spike, the lower axillary clusters small and all female. Fruiting perianth raised on a stipes of about 1 line, with a turbinate compressed tube of a little more than 1 line, and large green toothed valves, 3 lines broad or more. Fruit enclosed in the tube, but raised on a short solid base. Radicle superior.—*F. v. M. Ic. Sal. Pl.* 11.

Hab.: Inland localities.

This plant has the foliage almost of *A. nummularia*, but the fruiting perianths cannot be referred to any of these of allied species.—*Benth.*

9. **A. semibaccata** (part berry-like), *R. Br. Prod.* 406, *not of Moquin; Benth. Fl. Austr.* v. 175. Stems herbaceous, procumbent or prostrate, much branched and slender, spreading to 1 or 2 ft., the whole plant green and nearly glabrous or mealy-white. Leaves petiolate, oblong oblanceolate or cuneate and  $\frac{1}{2}$  to 1 in. long or shorter and obovate, obtuse, entire or sinuate-toothed, rather thin. Flowers monœcious, the males in little globular clusters in the upper axils surrounded by a few females, and a few females alone in the lower axils. Fruiting perianth more or less rhomboidal,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  lines long, and nearly as broad in the centre, the lower half a flattened triangular tube closed at the base, usually thickened (or sometimes fleshy?) and prominently 3-nerved, the upper half consisting of the flat appressed triangular valves, entire or toothed at the base, herbaceous at least at the margins. Fruit half enclosed in the tube. Radicle lateral.—*F. v. M. Ic. Sal. Pl.* 8; *A. denticulata*, *Moq. in DC. Prod.* xiii. ii. 97.

Hab.: Keppel Bay, *R. Brown*; Rockhampton, *O'Shanesy*; Darling Downs, *Lau*; Armadilla-W. *Barton*; Curriwillingham, *Dalton*. A common plant on Downs country.

10. **A. Muelleri** (after Baron Mueller), *Benth. Fl. Austr.* v. 175. An erect or spreading annual of 1 or 2 ft., with a hard base, more or less mealy-white, but not so densely scaly as the shrubby species. Leaves petiolate, broadly obovate ovate or rhomboidal, coarsely and irregularly sinuate-toothed or lobed, mostly from under 1 in. to about 2 in. long and rather thin. Flowers small, monœcious, all axillary, the males in the upper axils in little globular heads surrounded by a few females, the females alone clustered in the lower axils. Fruiting perianths sessile, 1 to  $1\frac{1}{2}$  line diameter, with a hard compressed globular smooth tube, the valves short broad appressed, shortly toothed. Fruit enclosed in the tube. Radicle superior.—*F. v. M. Ic. Sal. Pl.* 7.

Hab.: Peak Downs, *F. v. Mueller*; Armadilla, *W. Barton*; Diamantina and other inland localities.

Var. *lobaticarpa*, *F. v. M.*; Rep. on plants collected by Ch. Winnecke's Exped. Plant dwarf procumbent or ascendent. Fruiting-perianth minute, bivalved to the middle, digitate or flabellate rhomboid, anteriorly cleft into 5 deltoid semi-lanceolate lobules, the lateral ones divergent or recurved but often abbreviated, lower portion of perianth thickened towards the middle but not appendiculated.—Hab.: Central Australia, on the border of Queensland and South Australia.—*C. Winnecke (F. v. M.)*.

11. **A. campanulata** (campanulate), *Benth. Fl. Austr.* v. 177. A perennial, with a hard almost woody stock and rather slender procumbent branching stems extending to 1 or 2 ft., the whole plant nearly glabrous or mealy-white. Leaves shortly petiolate, obovate or oblong, entire or coarsely angular-toothed, mostly under  $\frac{1}{2}$  in. or rarely nearly 1 in. long. Flowers monœcious, all axillary, the males forming little globular heads or clusters of little more than 1 line diameter surrounded by several females, or all the flowers female in the lower axils. Fruiting perianth very shortly stipitate, the tube obliquely campanulate, slightly compressed, about 1 line long in front, longer at the back; the limb



much dilated, very oblique, the valves unequal and scarcely appressed, each one 3-lobed; with 2 small herbaceous appendages on the front or shorter face of the tube. Fruit enclosed in the tube. Radicle superior.

Hab.: Inland localities.

It approaches in habit, foliage and inflorescence *A. leptocarpa*, but the fruiting-perianth is totally different.—*Benth.*

12. **A. fissivalvis** (valves split), *F. v. M. Fragm.* ix. 123. Clothed slightly by a furfuraceous tomentum. Leaves  $\frac{1}{2}$  to 1 in. long, deep-green, rhomboid, the margin repand or a little toothed. Flowers in clusters, the terminal ones male, axillary ones female. The fruiting perianth almost rhomboid,  $1\frac{1}{2}$  to 3 lines long and broad, acuminate, the segments deeply laciniate. Seeds scarcely  $\frac{1}{2}$  line long.—*F. v. M. Ic. Sal. Pl. 1.*

Hab.: Inland localities.

13. **A. leptocarpa** (fruit slender), *F. v. M. in Trans. Phil. Inst. Vict.* ii. 74; *Benth. Fl. Austr.* v. 178. A perennial with a thick stock and herbaceous procumbent stems extending to 1 or 2 ft., the whole plant more or less hoary or white with a scaly tomentum. Leaves obovate or oblong, obtuse, entire when narrow, coarsely angular-toothed when broad, from under 1 in. to nearly 2 in. long. Flowers monœcious, all axillary, the males in little globular dense sessile heads of 1 to  $1\frac{1}{2}$  line diameter, mostly 4-lobed, surrounded by several females or sometimes females only in the lower axils more or less stipitate. Fruiting perianth narrow tubular, cylindrical, 2 to 4 lines long, the lower portion ( $\frac{1}{2}$  to  $\frac{2}{3}$ ) rather hard, enclosing the fruit which is more or less raised on the solid base of the tube, the upper portion above the fruit more herbaceous, green and elegantly veined, the orifice closed by 2 very short triangular entire valves not broader than the tube and without appendages. Radicle ascending or superior.—*F. v. M. Ic. Sal. Pl. 3.*

Hab.: Curriwillinghamie, Dalton; St. George, *J. Wedd*; Paroo, *F. v. Mueller.*

14. **A. limbata** (bordered), *Benth. Fl. Austr.* v. 178. A procumbent or spreading perennial with the habit, foliage and inflorescence of *A. leptocarpa*, but more scaly-tomentose. Leaves obovate or oblong, entire or angular-toothed. Flowers monœcious, all axillary, the male clusters in the upper axils surrounded by females, the lower clusters all females. Fruiting perianth with a cylindrical tube enclosing the fruit as in *A. leptocarpa*, but sessile and usually rather larger and harder, and sometimes the solid base much elongated, extending the whole tube to  $\frac{1}{2}$  in. or more, but varying in this respect even in the same cluster, the orifice closed by 2 valves reduced to 3 lobes, of which the lateral ones are spreading incurved and hornlike about 1 line long, those of the 2 valves more or less united, the central lobe minute or almost obsolete, and alternating with the horns are 2 herbaceous spreading broad dorsal appendages, also about 1 line long, giving the apex of the perianth the appearance of a spreading 4-lobed limb, but with the disk closed. Radicle of the seed ascending or superior.—*F. v. M. Ic. Sal. Pl. 4.*

Hab.: Southern localities.

15. **A. halimoides** (Halimus-like), *Lindl. in Mitch. Three Exped.* i. 285; *Benth. Fl. Austr.* v. 178. A procumbent or diffuse perennial or undershrub, with the habit and inflorescence of *A. holocarpa*, but usually not so white and the leaves narrower mostly lanceolate or ovate-lanceolate and acute, but sometimes as tomentose and passing into the small rhomboidal form of that species. Fruiting perianth enlarged to 4 to 6 lines diameter, loosely fibrous and spongy with an inner and an outer membrane as in *A. holocarpa*, but broadly turbinate or almost hemispherical with a much depressed or flattened summit bordered by

an annular horizontal wing or acute angle, the very small central orifice closed by small entire or 3-toothed erect valves as in the allied species. Fruit the same, except that the radicle appears to be always inferior not superior.—F. v. M. Ic. Sal. Pl. 19; *A. Lindleyi*, Moq. in DC. Prod. xiii. ii. 100; *A. inflata*, F. v. M. in Trans. Phil. Inst. Vict. ii. 75.

Hab.: Burnett River, *F. v. Mueller*; Suttor and Bogan Rivers, *Bowman*; Curriwillinghamie, *Dalton*; Barcoo, *Dr. Wuth*; Lawn Hill, *F. H. Hann*.

16. **A. holocarpa** (all fruit) *F. v. M. Rep. Babb. Exped.* 19; *Benth. Fl. Austr.* v. 179. A perennial with a hard almost woody base and herbaceous diffuse or procumbent branching stems, attaining from 6in. to above 1ft., softly mealy-tomentose. Leaves on rather long petioles, obovate or rhomboidal, irregularly toothed, from under  $\frac{1}{2}$ in. to above 1in. long. Flowers monœcious, all axillary, the males few in the upper axils surrounded by females, females only and usually few together in most axils, very small and globular at the time of flowering. Fruiting perianth obovoid-globular, scarcely compressed, not flattened at the top, 4 to 6 lines diameter, of a loosely fibrous and spongy consistence, with a thin membranous epidermis and a thin inner membrane scarcely distinguishable from the pericarp and sometimes (but not always) hardening over the seed as it ripens; the summit of the perianth with a small central orifice closed by 2 erect appressed, entire or 3-toothed valves, rarely above  $\frac{1}{2}$  line long. Seed with the superior radicle of the majority of those species in which it is enclosed in the perianth tube.—F. v. M. Ic. Sal. Pl.

Hab.: Paroo, Bowen Downs and Cooper's Creek, *F. v. Mueller*.

17. **A. spongiosa** (spongy), *F. v. M. in Trans. Vict. Inst.* ii. 74; *Benth. Fl. Austr.* v. 179. A small much-branched herb or undershrub, with numerous ascending or erect stems, not above 6in. high, more or less mealy-white as well as the foliage or becoming glabrous when old. Leaves shortly petiolate, broadly ovate obovate or orbicular, entire or sinuate-toothed, rather thick,  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long. Flowers monœcious and axillary as in *A. holocarpa*, but much smaller and fewer together, the females mostly solitary or only 2 in each axil. Fruiting perianth enlarged fibrous and spongy with a membranous epiderm and the inner membrane inseparable from the pericarp as in *A. holocarpa*, but much smaller, depressed, globular, not exceeding 2 lines diameter, the small orifice closed by 2 minute erect appressed triangular valves. Seed of *A. holocarpa* with the radicle erect.—F. v. M. Ic. Sal. Pl. 20. *A. semibaccata*, Moq. in DC. Prod. xiii. ii. 97, not of R. Br.

Hab.: Barcoo and other inland localities.

#### 4. CHENOLEA, Thunb.

(From *chen*, a goose, and *leia*, prey.)

(*Echinopsilon*, Moq. *Eriochiton*, *F. v. Muell.*)

Flowers hermaphrodite or polygamous. Perianth depressed-globular, membranous with 5 (or 4?) inflexed lobes closing over the fruit, and 5 or fewer dorsal divergent spines or soft horn-like appendages, often unequal, sometimes very small or quite obsolete. Stamens 5. Styles 2 or 3, connate at the base. Fruit enclosed in the perianth, more or less depressed. Pericarp membranous. Seed horizontal or oblique; embryo annular, the radicle often ascending over the cotyledonar end.—Diffuse or spreading undershrubs or shrubs. Leaves alternate, narrow, usually soft and silky-villous or woolly, rarely glabrous. Flowers sessile and solitary in the axils, enveloped in cottony wool or long hairs.

The genus is spread over the temperate regions of the Old World, the Australian species apparently all endemic, one only being found in Queensland.

1. **C. sclerolænoides** (Sclerolæna-like), *F. v. M.*; *Benth. Fl. Austr.* v. 192. A small undershrub, much branched at the base, usually under 6in. high, densely clothed with a soft rather loose woolly tomentum. Leaves sessile, linear, obtuse, soft, 2 to 3 or rarely 4 lines long. Flowers solitary in the axils, densely involved in woolly hairs forming when in fruit a globular mass of 2 to 3 lines diameter. Perianth concealed in the wool, with 5 short flat lobes closing over the fruit, 5 dorsal erect membranous bifid appendages, and lower down 5 linear sometimes pungent and spine-like appendages radiating from near the base, all usually concealed under the wool or points of the spines slightly protruding. Styles 2, united at the base. Seed horizontal; embryo flat, annular, the radicle either not at all or only very slightly rising above the cotyledonar end.—*F. v. M. Ic. Sal.* 301, Pl. 82; *Eriochiton sclerolænoides*, *F. v. M. Second Rep.* 15; *Echinopsilon sclerolænoides*, *F. v. M. in Trans. Phil. Inst. Vict.* ii. 75.

Hab.: Southern localities.

## 5. KOCHIA, Schrad.

(After Dr. W. D. J. Koch).

(Maireana, *Mog.*, *Sclerochlamys*, *F. v. M.*)

Flowers hermaphrodite or polygamous. Perianth at first nearly globular, at length depressed turbinate or pyramidal, not succulent, with 5 rarely 4 short broad lobes connivent and closing over the fruit, imbricate in the bud and 3 outer ones often rather larger than the 2 inner ones, bearing on their backs horizontal wings either distinct or united in a single annular wing surrounding the perianth. Stamens usually 5 or fewer by abortion. Styles 2 or 3, shortly connate at the base. Fruit depressed-globular, enclosed in the perianth; pericarp membranous. Seed more or less flattened, horizontal; testa membranous; embryo horseshoe-shaped or almost annular, enclosing a scanty albumen.—Undershrubs or shrubs, usually procumbent or spreading. Leaves linear or rarely oblong, usually small thick and often semiterete. Flowers solitary or very rarely 2 together in the axils, sessile, with very minute or without any bracts, the perianth very small at the time of flowering with the stamens and styles shortly exerted, but in most species there appear to be many female flowers without any perfect stamens. Fruiting perianth usually described as variously coloured red, from a pale pink to a rich crimson, but no colour remains in the dried specimens.

The genus is limited to the extratropical and subtropical regions of the Old World, the Australian species being apparently all endemic.

Fruiting perianth with an appendage to each sinus, besides the horizontal wings. Leaves softly silky.

Sinus-appendages linear, acute, erect above the horizontal wings which are more or less united in a ring . . . . .

1. *K. lanosa*.

Fruiting perianth without sinus-appendages, but with 3 rarely 4 longitudinal wings on the tube below the horizontal ones which are united in a ring . . . . .

2. *K. triptera*.

Fruiting perianth without any appendages besides the horizontal wings which are membranous and entire or irregularly denticulate.

Horizontal wings all distinct, all 5 equal. Leaves usually narrow, 1 to 2 lines long . . . . .

3. *K. brevifolia*.

Horizontal leaves more or less perfectly united in a ring.

Fruit nearly  $\frac{1}{2}$  in. wide and very spongy . . . . .

4. *K. spongiocarpa*.

Perianth flat within the wings or nearly so.

Leaves mostly  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, linear or terete, tomentose or nearly glabrous (sometimes small and slender), spreading. Perianth glabrous or tomentose . . . . .

5. *K. villosa*.

Leaves oblong or oblanceolate, flat,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Perianth of *K. villosa* . . . . .

6. *K. planifolia*.

Leaves oblong-clavate, almost terete, densely cottony, not exceeding  $\frac{1}{2}$  in. Perianth of *K. villosa* . . . . .

7. *K. sedifolia*.

Leaves minute, distant. Branches spinescent. Perianth of

*K. villosa* . . . . . 8. *K. aphylla*.

Fruiting perianth very flat at the top, surrounded by an annular more or less rigid horizontal border or thick wing, quite entire or regularly toothed.

Annular border of the perianth 5-lobed, yellowish . . . . . 9. *K. dichoptera*.

Annular border 5-angled, tube vertically 5-winged . . . . . 10. *K. brachyptera*.

Annular border with 10 to 12 radiating points, tube smooth . . . . . 11. *K. stelligera*.

1. ***K. lanosa*** (woolly), *Lindl. in. Mitch. Trop. Austr.* 88; *Benth. Fl. Austr.* v. 184. An erect or spreading undershrub or low shrub, the branches and foliage silky-woolly. Leaves sessile, linear, mostly acute, thick and soft, from under  $\frac{1}{4}$  in. to nearly  $\frac{1}{2}$  in. long, flowers solitary in the axils. Fruiting perianth more or less woolly all over, depressed and about 1 line diameter within the wings, the lobes obtuse and closed over the fruit, the 5 dorsal wings thin and membranous, all distinct but not stipitate, or more or less connate, spreading to from 4 to 6 lines diameter, with 5 linear acute appendages, alternating with the horizontal wings, erect on their upper side and varying from  $\frac{1}{2}$  to  $1\frac{1}{2}$  line in length. Styles 3 or rarely 2.—*Moq. in DC. Prod.* xiii. ii. 461; *F. v. M. Ic. Sal. Pl.* 46.

Hab.: Narran River, *Mitchell*; and other inland localities.

2. ***K. triptera*** (3-winged), *Benth. Fl. Austr.* v. 185. A low but stout diffuse or spreading shrub or undershrub, the foliage and often the branches also quite glabrous and somewhat glaucous. Leaves rather crowded, linear, semiterete, often acute, rather thick,  $\frac{1}{4}$  to above  $\frac{1}{2}$  in. long. Flowers solitary in the axils. Fruiting perianth with a broadly turbinate tube, above 1 line long below the horizontal wings, with 3 or rarely 4 very prominent vertical wings, and more than half of it occupied by a thick solid base below the fruit, the upper part of the perianth within the wings flat and closing over the fruit as in most *Kochias*, the horizontal wings united in a single rigidly membranous ring expanding to 4 or 5 lines or even  $\frac{1}{2}$  in. diameter and quite concealing the vertical wings. Styles usually 3.—*F. v. M. Ic. Sal. Pl.* 50.

Hab.: Recorded for Queensland by *F. v. M.*

3. ***K. brevifolia*** (leaves short), *R. Br. Prod.* 409; *Benth. Fl. Austr.* v. 185. A much-branched rather slender shrub, the branches and foliage pubescent or tomentose with short woolly hairs or the leaves glabrous. Leaves alternate, sessile, linear or oblong, obtuse, thick and almost terete or somewhat flattened, about 1 line or rarely nearly 2 lines long. Flowers small and solitary in the axils. Fruiting perianth much depressed, glabrous or slightly pubescent, the tube hemispherical, the upper portion scarcely 1 line diameter within the wings, with 5 equal broad obtuse lobes horizontally closed over the fruit but rather thick and almost bullate, forming 5 distinct prominences, the perianth bordered by 5 horizontal membranous veined wings, forming a complete circle of about 3 lines diameter but not united as in all the following species. Styles usually 2, rather short, united at the base.—*Moq. in DC. Prod.* xiii. ii. 131; *F. v. M. Ic. Sal. Pl.* 43; *Salsola brachyphylla*, *Spreng. Syst. i.* 924; *Kochia thymifolia*, *Lindl. in Mitch. Trop. Austr.* 56, *Moq. l.c.* 461.

Hab.: Darling Downs, *Lau*; Armadilla, *W. Barton*; St. George, *J. Wedd*; and many more inland localities.

4. ***K. spongiocarpa*** (fruit spongy), *F. v. M., Vict. Nat.* iii. 92. Plant erect, branches whitish velvet-downy. Leaves  $\frac{1}{3}$  to  $\frac{1}{2}$  in. long, semi-cylindrical-linear, rather long, somewhat pointed, glabrous; style enclosed; stigmas generally 2, sometimes bifid; fruit-bearing calyx nearly  $\frac{1}{2}$  in. wide, pale-brown,

quite spongy, almost semi-globular, slightly wrinkled, glabrous, the flat summit expanding into a narrow undivided membrane, the transverse of it very subtle.—F. v. M., Ic. Sal. Pl. 51.

Hab.: Given as a Queensland plant in *F. v. Muell. 2nd Syst. Cens. Austr. Pl. 51.*

5. **K. villosa** (villose), *Lindl. in Mitch. Trop. Austr. 91*; *Benth. Fl. Austr. v. 186*. An undershrub or shrub, erect spreading or decumbent, more or less silky-villous tomentose or woolly, or the foliage at length nearly glabrous. Leaves alternate, linear, obtuse, thick and soft in the typical form, terete or flattened, from under  $\frac{1}{4}$  in. to about  $\frac{1}{2}$  in. long. Flowers solitary in the axils. Fruiting perianth depressed, from quite glabrous except a slight pubescence on the edge of the lobes to tomentose all over including the wings, the tube short and broad without vertical wings, the summit flat within the wings, the lobes very short and closed over the fruit, the dorsal wings united in a single entire or rarely lobed horizontal ring, membranous and very finely veined, spreading to from  $\frac{1}{4}$  to nearly  $\frac{1}{2}$  in. diameter. Styles 2 or 3, usually long, united at the base.—*Moq. in DC. Prod. xiii. ii. 461*; *F. v. M. Ic. Sal. Pl. 53*; *Maireana tomentosa*, *Moq. in Ann. Sc. Nat. Ser. 2, xv. 97, t. 13*; and in *DC. Prod. xiii. ii. 130*; *Kochia tomentosa*, *F. v. M. Rep. Babb. Exped. 20*; *K. pubescens*, *Moq. in DC. Prod. xiii. ii. 131* as the Australian but not as to the S. African plant.

Hab.: Narran River, *Mitchell*; Suttor Desert, *F. v. Mueller*; Darr River, *C. W. de Burgh-Birch*; Landsdown, *F. M. Bailey*.

The species varies exceedingly in foliage and indumentum as well as in the size of the perianth-wing, which, moreover, although usually quite entire, is sometimes irregularly lobed.

Var. *tenuifolia*, *F. v. M.* Nearly glabrous. Leaves fine, 2 to 4 lines long. Perianth rather small and late in developing the wing. Perhaps a distinct species.—Darling Downs, *Woolfs*; Curriwillinghamie, *Dalton*; Armadilla, *W. Barton*; Cooper's Creek, *Murray*.

6. **K. planifolia** (leaves flat), *F. v. M. Pragm. i. 213*; *Benth. Fl. Austr. v. 187*. An erect divaricately branched shrub of 2 to 3 ft. (*Oldfield*), the branches and young foliage covered with a soft and dense woolly tomentum which wears off from the older leaves. Leaves oblong or oblanceolate, obtuse, contracted into a distinct petiole,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long rather thick but flat. Fruiting perianth precisely that of *K. villosa*, glabrous or tomentose, the wing generally entire, membranous and attaining 5 to 6 lines diameter.

Hab.: Recorded for Queensland by *F. v. M.*

7. **K. sedifolia** (Sedum-leaved), *F. v. M. in Trans. Vict. Inst. 1855, 134*, and in *Hook. Kew Journ. viii. 205*; *Benth. Fl. Austr. v. 187*. A stout very densely branched shrub attaining 2 to 3 ft., white or fulvous all over with a rather close dense cottony wool. Leaves oblong-clavate, obtuse, soft thick and often nearly terete, contracted at the base but sessile, mostly  $1\frac{1}{2}$  to 3 lines long. Flowers rather crowded, often two in the same axil. Flowering perianth globular, densely tomentose, not 1 line diameter. Fruiting perianth of *K. villosa*, but the wing usually more regularly circular, glabrous or tomentose, expanding to 3 or 4 lines diameter. Styles usually 3.

Hab.: Inland localities.

8. **K. aphylla** (leafless), *R. Br. Prod. 409*; *Benth. Fl. Austr. v. 188*. A rigid divaricately branched scrubby shrub with rather slender spinescent branches, the whole plant white with a short soft woolly tomentum or becoming at length nearly glabrous. Leaves minute and deciduous, rarely above  $\frac{1}{2}$  line long, although on some luxuriant barren branches they may exceed 1 line, the older branches usually glabrous and leafless. Fruiting perianth entirely that of *K. villosa*, of which *F. v. M.* considers this plant as a variety only. *Moq. in D.C. Prod. xiii. ii. 131*; *F. v. M. Ic. Sal. Pl. 55*.

Hab.: Armadilla, *W. Barton*; and many other inland localities.

9. **K. dichoptera**† (2-winged), *F. v. M. Fragm.* viii. 37 and 163. Erect, the branches hoary-tomentose. Leaves scattered, about 1 in. long, narrow-linear, silky-pubescent. Flowers digynous. Fruit wings yellowish, membranous, the horizontal wing almost 1 line broad, quinque-crenate or entire, connate with the longitudinal wing. Fruit slightly 3-ribbed, silky-hairy. Seed depressed, 1 line broad, bright-brown.

Hab.: Barcoo and Bowen Downs, *F. v. Mueller*.

10. **K. brachyptera** (wings short), *F. v. M. 2nd. Gen. Rep.* 15; *Benth. Fl. Austr.* v. 189. A prostrate undershrub, spreading to 1 ft. or more, with shortly ascending branches, clothed as well as the foliage with long soft spreading hairs, not forming the cottony wool of most species. Leaves alternate, linear, sessile,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, flat and thinner than in most species. Flowers small, solitary in the axils, the perianth ovoid with 5 short erect obtuse membranous lobes. Stamens 5. Styles 2, connate at the base. Fruiting perianth about  $1\frac{1}{2}$  line diameter including the wings, the tube below the horizontal wing hemispherical, shortly hollowed at the base, with 5 vertical wings adnate to the horizontal one and tapering to the base, the summit very flat, bordered by an exceedingly narrow rather thick horizontal 5-angled wing, the angles very acute, being the small points of the vertical wings.—*F. v. M. Ic. Sal. Pl.* 59; *Sclerochlamys brachyptera*, *F. v. M. in Trans. Phil. Inst. Vic.* ii. 76; *Echinopsilon brachypterus*, *F. v. M. Fragm.* vii. 13.

Hab.: Towards Cooper's Creek.

11. **K. stelligera** (starry), *F. v. M. Fragm.* vii. 13; *Benth. Fl. Austr.* v. 189. A diffuse or procumbent undershrub spreading to 1 ft. or more, with numerous rather slender ascending branches not above 6 in. high, clothed as well as the young foliage with a white cottony wool wearing off from the older leaves. Leaves alternate, sessile, narrow-linear, erect or spreading, very soft, 1 to 3 lines long. Flowers small, solitary in the axils, but often crowded in woolly leafy tufts at the ends of the branches, the perianth nearly globular, woolly outside, with short lobes about  $\frac{1}{2}$  line long. Stamens included. Styles 2, rather long, scarcely united at the base. Fruiting perianth nearly  $1\frac{1}{2}$  line diameter, of a thick hard consistence, the teeth hemispherical, quite smooth, without vertical wings, the basal hollow small, the summit very flat, bordered by a very narrow rather rigid horizontal wing, with 10 to 12 short rigid, equally radiating teeth or points.—*Maireana stelligera*, *F. v. M. Fragm.* i. 139; *Echinopsilon stelligerus*, *F. v. M. Fragm.* vii. 13.

Hab.: Maranoa, *Rev. B. Scortechini*.

## 6. ENCHYLÆNA, R. Br.

(Referring to the succulent calyx.)

Flowers hermaphrodite. Perianth urceolate, at length depressed-globular, succulent or coriaceous, with 5 short broad lobes or teeth connivent and closing over the fruit without any dorsal wings or appendages. Stamens 5 or fewer. Ovary depressed globular. Styles 2 or 3, shortly connate at the base. Fruit depressed-globular, enclosed in the perianth, pericarp membranous. Seed more or less flattened, horizontal; testa membranous; embryo horseshoe-shaped or almost annular, enclosing a very scanty albumen.—Undershrubs or shrubs. Leaves linear-terete or linear-lanceolate, entire. Flowers solitary in the axils and sessile, without any or with one or two minute bracts.

The genus is limited to Australia. It only differs from *Kochia* in the fruiting perianth of a thicker consistence and often succulent, without any dorsal wings or appendages.—*Benth.*

Leaves 1 to 2 lines long. Flowers numerous, mostly crowded in terminal leafy spikes. Perianth not above 1 line diameter. . . . . 1. *E. microphylla*

Leaves mostly above  $\frac{1}{2}$  in. long. Flowers distant.

- Fruiting perianth depressed-globular, about  $1\frac{1}{2}$  line diameter, quite smooth, with very short teeth. . . . . 2. *E. tomentosa*  
 Fruiting perianth coriaceous, depressed-globular, about 2 lines diameter, the lobes more or less gibbous outside . . . . . 3. *E. villosa*.

1. ***E. microphylla*** (leaves small), Moq. in DC. Prod. xiii. ii. 128; Benth. Fl. Austr. v. 181. A diffuse divaricate (or erect?) shrub, with numerous slender branches, slightly pubescent. Leaves linear-terete, fine or rather thick, 1 to 2 lines long. Flowers small, solitary in each axil as in the other species, but numerous and crowded into leafy spikes at or near the ends of the branches. Fruiting perianths  $\frac{3}{4}$  to nearly 1 line diameter, shaped like those of *E. tomentosa*, but smaller, thinner (not succulent?) and slightly angular. Styles usually 2.—*Suaeda tamariscina*, Lindl. in Mitch. Trop. Austr. 239; Moq. in DC. Prod. xiii. ii. 461.

Hab.: Near Mount Kilsyth, Mitchell; Darling Downs, Lau; and other localities.

2. ***E. tomentosa*** (tomentose), R. Br. Prod. 408; Benth. Fl. Austr. v. 181. "Kooloo-loomoo," Cloncurry, Palmer. A procumbent or divaricately branched undershrub, sometimes with ascending slightly branched stems under 6 in. long, sometimes much branched and attaining several feet, the branches hoary or silvery with a close or woolly tomentum, rarely glabrous or nearly so. Leaves linear-terete, entire, rarely above  $\frac{1}{2}$  in. long and sometimes under  $\frac{1}{4}$  in. Flowers all axillary, solitary and sessile and usually distant, with 1 or 2 minute bracts at the base. Perianth small at the time of flowering,  $1\frac{1}{2}$  line diameter when in fruit and then depressed-globular, red and succulent when fresh, black when dry and perfectly smooth, the orifice closed by 5 short connivent teeth quite glabrous or minutely ciliate. Stamens very shortly exerted, the anthers very deciduous. Fruit enclosed in the perianth, the pericarp membranous and glabrous or scarcely hairy in the normal state. Styles usually 3 but sometimes 2.—Moq. in DC. Prod. xiii. ii. 128; Nees in Pl. Preiss. i. 635; F. v. M. Ic. Sal. Pl. 85; *E. paradoxa*, R. Br. Prod. 408; Moq. l.c.; *E. pubescens*, Moq. l.c. (monstrous states, see below).

Hab.: Burdekin River, F. v. Mueller; Bokhara Creek, Leichhardt; Rockhampton, O'Shanesey; Sutor River, Bowman; Armadilla, W. Barton; Darr River, W. de Burgh-Birch; Diamantina, Dr. Thos. L. Bancroft.

Var. ? *leptophylla*. Leaves very slender. Perianths very small.—Near Gainsford, Bowman. —Perhaps a distinct species, but the specimens are very small.—Benth.

Var. *glabra*. Stems and leaves quite glabrous.—Bay of Inlets, Banks and Solander; Brisbane River, F. v. Mueller; Cooper's Creek, Wheeler (F. v. M.).

Besides the woolly globular galls to which this species is liable (like those of the *Kochia villosa* and other Chenopodiaceæ), it is subject to a monstrosity, apparently caused also by an insect, by which the pericarp becomes densely enveloped in woolly intricate hairs proceeding from near the base and bursting through the apex of the perianth; whilst the ovary is abortive, and I have sometimes found its place occupied by a small grub. It is this monstrosity in the typical form that is described by Moquin as *E. pubescens*, and in the glabrous variety constitutes the *E. paradoxa*, Br.—Benth.

Fruit eaten raw.—Palmer.

3. ***E. villosa*** (villose), F. v. M. in Trans. Phil. Inst. Vict. ii. 76; Benth. Fl. Austr. v. 182. Stems branching at the base, procumbent or ascending, rarely exceeding 6 in., the whole plant or at least the inflorescence villous, or the lower part or nearly all glabrous. Leaves linear or linear-lanceolate, acute or obtuse, contracted at the base and sometimes petiolate, rather thick, rarely  $\frac{1}{5}$  in. and often not  $\frac{1}{4}$  in. long. Flowers in the upper axils but not crowded. Fruiting perianth depressed as in *E. tomentosa*, but more angular, about 2 lines diameter, coriaceous and not succulent, black when dry, shortly hirsute or rarely glabrous, the lobes connivent and closed over the fruit, larger and deeper than in *E. tomentosa*; 2 or 3 outer ones broad and thickened near the apex into 2 obtuse

angles or lobes, or one of the outer ones irregular, 2 very rarely 3 inner ones flat and triangular with a thickened transverse line at the base outside. Styles 2 (or rarely 3?). Fruit and seed of *E. tomentosa*.

Hab.: Armadilla, *W. Bartou*; and other southern inland localities.

This species connects in some measure *Enchylæna* with *Kochia*, for the transverse thickening of the perianth-lobes may be regarded as an incipient wing. The names both of *E. villosa* and *E. tomentosa* are unfortunately selected, as both are sometimes almost if not quite glabrous.—*Benth.*

## 7. **BABBAGIA**, *F. v. M.*

(After H. Babbage.)

Flowers hermaphrodite. Perianth urceolate, hard when in fruit, with 4 (or 5?) small membranous lobes, and 2 or 3 dorsal membranous stipitate wings more or less vertical. Stamens 4 (or 5?). Styles 2, connate at the base. Fruit enclosed in the perianth. Pericarp membranous. Seed horizontal; testa membranous; embryo nearly annular, enclosing a mealy albumen, the radicle slightly ascending above the cotyledonar end.—Diffuse glabrous undershrubs or shrubs. Leaves linear, alternate. Flowers solitary in the axils, sessile, without bracts.

The genus is limited to Australia.

Leaves linear or oblanceolate. Fruit appendages, wings semi-circular contracted into a thick base . . . . .	1. <i>B. diptercarpa</i> .
Leaves almost semi-cylindric. Fruit appendages, not membranous, rhomboid or obovate-cunate . . . . .	2. <i>B. scleroptera</i> .
Leaves oblong, semi-cylindric. Fruit appendages, wings terminal stipitate . . . . .	3. <i>B. acroptera</i> .

1. ***B. diptercarpa*** (fruit 2-winged), *F. v. M. Rep. Babb. Exped.* 21; *Benth. Fl. Austr.* v. 192. A small much-branched diffuse undershrub or spreading shrub, glabrous except sometimes a slight wool in the axils of the leaves, and more or less glaucous. Leaves linear or oblanceolate, thick or semiterete, under 3 lines long, often crowded on the young branches. Fruiting perianth rather more than 1 line long, the hollow base about  $\frac{1}{2}$  line long and as much diameter, closed under the fruit, the fruit-bearing part depressed-globular, about  $\frac{3}{4}$  line diameter, the broad membranous semicircular wings expanding to about 3 lines diameter, each wing contracted into a thick base and placed obliquely or vertically with reference to the perianth, apparently by the torsion of the base. Fruit much depressed. Seeds very flat.—*Hook. Ic. Pl.* t. 1078.

Hab.: South-western inland localities towards Cooper's Creek.

2. ***B. scleroptera*** (fruit-wings hard), *F. v. M. in Sou. Sc. Rev.* Nov. 1885. Leaves short, almost semi-cylindrical; axils not distinctly bearded; the tube of the fruit-calyx turgid, downward smooth, deeply excavated at the base inside, streaked towards the summit, terminated by generally 5 but sometimes fewer rhomboid or obovate-cuneate not membranous appendages. Seed lodged above the middle of the calyx-tube.—*F. v. M. Ic. Sal. Pl.* 38.

Hab.: Near the Warrego.—*Betche.*

This species differs in that its appendages do not reach to the base of the calyx-tube and, are not, or only slightly expanded into a tender membrane. Indeed, it is near to *B. acroptera*, from which it is distinct in its fruit-calyx being more turgid and not oblique at the base, and producing an augmented number of appendages devoid of any ample terminating membrane.—*F. v. M., l.c.*

3. ***B. acroptera*** (winged at top), *F. v. M. et Tate, Trans. Roy. Soc. of Austr.* vi. 108, 1883. Leaves oblong, semi-cylindrical; fruit-calyx above the tubular base turgid, thence produced into two oblique-roundish or broad-cuneate completely terminal and conspicuously stipitated membranous appendages.—*F. v. M. Ic. Sal. Pl.* 39.

Hab.: Queensland. *F. v. Mueller.*—Third Suppl. Cens. Austr. Pl.

The following, according to Baron Mueller, are the chief characteristics which distinguish this plant from *B. diptercarpa*. The narrow hollow base of aged calyx-tube, the more stipitate not reniform appendages, one of the two being more developed than the other.



8. **SCLEROLÆNA**, R. Br.

(Referring to the dry, hard covering of the fruit).

(*Kentropsis*, Moq.; *Dissocarpus*, F. v. Mueller.)

Flowers hermaphrodite. Perianth at first nearly glabular, at length turbinate or depressed, somewhat compressed, not succulent and usually hard, with 5 short inflexed lobes, and 2 dorsal opposite divergent spines, either both equal or one smaller or scarcely developed. Stamens 5. Styles 2 or rarely 3, connate at the base. Fruit globular or depressed; pericarp membranous. Seeds usually globular or depressed at the base, with a more or less prominent ascending or erect rostellum. Testa membranous. Embryo almost annular, surrounding a mealy albumen, the radicle ascending above the cotyledonar end into the rostellum of the seed.—Undershrubs or shrubs, either prostrate decumbent or divaricately branched. Leaves alternate, narrow, usually soft and silky-villous or woolly. Flowers sessile in the axils, enveloped in cottony wool or soft hairs.

The genus is limited to Australia. It is nearly allied to *Anisacantha*, but the spines of the perianth (which I always find dorsal, not terminating the lobes as described by Moquin) are two only, and the seed is not so distinctly vertical.—*Benth.*

Flowers solitary in the axils.

- |                                                                                                                            |                           |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Fruiting perianth 1 to 1½ line long and usually as broad, tomentose or nearly glabrous.                                    |                           |
| Leaves narrow-linear, rather acute. Spines 1 to 3 lines long, glabrous or nearly so . . . . .                              | 1. <i>S. diacantha</i> .  |
| Fruiting perianth 2 lines long, densely covered as well as the spines with long hairs . . . . .                            | 2. <i>S. lanicuspis</i> . |
| Fruiting perianth 2 to 3 lines diameter, enveloped in a thick mass of white cottony wool. Spines ¼ to ½ in. long . . . . . | 3. <i>S. bicornis</i> .   |
| Flowers 2 or 3 together united at the base and diverging horizontally . . . . .                                            | 4. <i>S. biflora</i> .    |
| Flowers several together united in a hard globular mass . . . . .                                                          | 5. <i>S. paradoxa</i> .   |

1. ***S. diacantha*** (spines 2), *Benth. Fl. Austr.* v. 194. A diffuse or prostrate undershrub, densely clothed with a soft fulvous or white tomentum more silky on the foliage. Leaves sessile, linear, mostly acute, very soft, sometimes rather thick and ¼ to ½ in. long, sometimes longer and narrower, the floral ones not broader. Flowers solitary, the perianth broadly campanulate or almost urceolate, about ½ line long and ¾ line broad, the lobes very short membranous and slightly inflexed, the 2 opposite dorsal spines already long and nearly as deep as the perianth-tube. Anthers 5, half exserted. Styles 2 (or 3?) very shortly connate at the base. Fruiting perianth hard, tomentose, depressed and slightly compressed at the top, about 1 line long, and the flat slightly hollow base 1 to 1½ line diameter, closed at the orifice, the two opposite dorsal spines diverging or divaricate, nearly equal and varying in the typical form from 1 to nearly 2 lines in length. Seed globular or oblique, with an ascending or erect rostellum. Embryo horizontally annular with an erect radicle.—F. v. M. Ic. Sal. Pl. 78; *Anisacantha diacantha*, Nees in Pl. Preiss. i. 635; *Kentropsis diacantha*, Moq. in DC. Prod. xiii. ii. 138 (both from Moquin's descr.); *Anisacantha kentropsidea*, F. v. M. in Trans. Vict. Inst. 1855, 133, and in Hook. Kew. Journ. viii. 204, reduced to *A. diacantha* in *Fragm.* vii. 14.

Hab.: Cape River, *Bowman*; Armadilla, *W. Barton*; Box Forest, *Leichhardt*; and other inland localities.

2. ***S. lanicuspis*** (points woolly), *F. v. M.*; *Benth. Fl. Austr.* v. 195. A low undershrub or shrub, the stems rather stout and not exceeding 6 in. densely clothed with a loose cottony wool, more silky and appressed on the leaves. Leaves rather crowded, linear, thick and soft, often above ½ in. long, Fruiting perianth similar to that of *S. diacantha* but rather larger, 1½ to 2 lines long and very densely clothed with long silky or woolly hairs, the two dorsal

opposite spines divergent, nearly equal, 1 to 2 lines long.—F. v. M. Ic. Sal. Pl. 80; *Anisacantha lanicuspis*, F. v. M. Fragn. ii. 170; *Kentropsis eriacantha*, F. v. M. l.c. 140.

Hab.: Stanthorpe and to the border of N.S.W., and other inland localities.

3. **S. bicornis** (2-horned), *Lindl. in Mitch. Three Exped.* ii. 47; *Benth. Fl. Austr.* v. 195. A stout shrub, with divaricate rather thick branches, clothed with a short but soft cottony wool. Leaves very narrow-linear, acute, semiterete, often above  $\frac{1}{2}$  in. long, tomentose when young, becoming glabrous when full grown. Flowers solitary in the axils, the perianth  $1\frac{1}{2}$  line long at the time of flowering. Fruiting perianth 2 to 3 lines diameter within the dense white cottony wool which covers it and almost doubles its size, very hard, nearly globular but slightly compressed, with 2 rigid divaricate dorsal spines, varying in length from  $\frac{1}{4}$  to  $\frac{1}{2}$  in. or sometimes nearly  $\frac{3}{4}$  in. Seed horizontal, with a long ascending rostellum.—Moq. in DC. Prod. xiii. ii. 123; F. v. M. Ic. Sal. Pl. 79; *Kentropsis lanata*, Moq. Chenop. Enum. 83, and in DC. Prod. xiii. ii. 138; *Anisacantha bicornis*, F. v. M. Fragn. vii. 14.

Hab.: Curriwillinghie, Bowen Downs and many other inland localities.

4. **S. biflora** (2-flowered), *R. Br. Prod.* 410; *Benth. Fl. Austr.* v. 196. A procumbent or spreading branching shrub, clothed with a short close cottony wool, rather looser and more silky on the foliage of luxuriant shoots. Leaves sessile, narrow-linear, acute or obtuse, very soft  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Flowers 2 or rarely 3 together in the axils, connate at the base and divaricate at a very early stage. Perianth at the time of flowering about  $\frac{3}{4}$  line long and broad, deeply divided into 5 lobes inflexed at the end, densely enveloped in cottony wool. Styles 2, connate at the base. Fruiting perianths horizontally diverging from an continuous with a common very broad hollow base or peduncle of about 1 line, the perianths themselves about  $1\frac{1}{2}$  line long, very hard and thick at the base, the orifice nearly closed by the inflexed thinner lobes without any or sometimes with 1 or two dorsal minute tubercles or short spines. Pericarp depressed. Seed horizontal or somewhat oblique with an ascending rostellum. Embryo annular with an ascending or erect radicle.—Moq. in DC. Prod. xiii. ii. 123; F. v. M. Ic. Sal. Pl. 61; *Dissocarpus biflorus*, F. v. M. in Trans. Phil. Inst. Vict. ii. 75.

Hab.: On many of the inland Downs.

5. **S. paradoxa** (paradoxical), *R. Br. Prod.* 410; *Benth. Fl. Austr.* v. 196. A decumbent much-branched undershrub, rarely exceeding 1 ft., densely clothed with a loose cottony wool. Leaves sessile, narrow-linear, obtuse, soft and woolly or rarely becoming glabrous with age, from under  $\frac{1}{4}$  to nearly  $\frac{1}{2}$  in. long. Flowers in dense axillary clusters, the perianths small, deeply lobed. Styles 2, connate to the middle. Fruiting perianths 10 to 20 together, very hard at the base, connate into a globular cottony or woolly mass of 5 or 6 lines diameter, each perianth with 1 or 2 small dorsal spines shortly protruding from or almost concealed in the wool. Seed nearly globular with a short ascending rostellum; embryo forming a complete circle with the radicle turned upwards over the cotyledonary end.—Moq. in DC. Prod. xiii. ii. 123; F. v. M. Ic. Sal. Pl. 62.

Hab.: Inland localities.

## 9. ANISACANTHA, R. Br.

(Referring to the unequal spines of the perianth).

Flowers hermaphrodite. Perianth urceolate or ovoid, hard when in fruit, obliquely attached at the base, with 4 or 5 short membranous lobes and 3 to 5 dorsal divergent unequal spines, 1 usually much smaller than the others or reduced to a tubercle. Stamens 5 or fewer. Styles 2 or 3, connate at the base

in a column usually persistent and hardened. Fruit enclosed in the perianth, usually ovoid. Pericarp membranous. Seed vertical, somewhat compressed; testa membranous; embryo annular or nearly so, surrounding a mealy albumen, the radicle erect.—Intricately branched shrubs or diffuse undershrubs, glabrous or very rarely villous, especially the young shoots. Leaves linear, alternate, sessile. Flowers solitary in the axils. Fruiting perianths closely sessile and often almost adnate at the base to the stem and to the subtending leaf. Bracts none.

The genus is limited to Australia.

Leaves linear or linear-lanceolate, flat, contracted at the base. Perianth-

spines 5 or 4, one often very small . . . . . 1. *A. muricata*.

Leaves obovate or oblong-lanceolate. Perianth-spines 5 . . . . . 2. *A. Birchii*.

Leaves linear-terete or semiterete.

Perianth-spines 3 rarely 4, one sometimes very small.

Shrubby. Perianth above 1 line long.

Smallest spine above 1 line long . . . . . 3. *A. divaricata*.

Smallest spine reflexed to a tubercle or rarely nearly 1 line long . . . 4. *A. bicuspis*.

Perianth-spines 5, short. Small diffuse undershrub. Perianth under

1 line long. . . . . 5. *A. echinopsila*.

1. ***A. muricata*** (muricate), *Moq. Chenop. Enum.* 84, and in *DC. Prod.* xiii. ii. 122; *Benth. Fl. Austr.* v. 199. Roley-poley. A broad bushy or spreading shrub of 2 or 3 ft., with numerous intricate flexuose branches, the typical form quite glabrous and somewhat glaucous, or the young shoots slightly villous. Leaves linear, flat but rather thick, mucronate-acute, contracted at the base, from scarcely above  $\frac{1}{4}$  in. to nearly 1 in. long. Fruiting perianth adnate by an oblique base, the hard tube rarely above 1 line long, the membranous lobes short, the dorsal spines 4 or 5, very unequal and spreading, the longest 3 to 6 lines long, the smallest very short, and often the 2 smallest united at the base.—*A. quinquecuspis*, F. v. M. in *Trans. Vict. Inst.* 1855, 134, and in *Hook. Kew. Journ.* viii. 204.

Hab.: Armadilla, *W. Barton*; inland Downs country.

Var. *villosa*. The whole plant, at least in young specimens, softly villous.—*A. gracilicuspis*, F. v. M. *Fragm.* ii. 170.—*Mackenzie Downs*, F. v. *Mueller*.

2. ***A. Birchii*** (after C. W. de B.-Birch), *F. v. M. Fragm.* viii. 163. The whole plant clothed in a white tomentum. Leaves obovate or oblong-lanceolate, 3 to 5 lines long, cuneate at the base. Flowers axillary and sessile, spines 5, setaceous, subulate, 2 longer than the others. Style very short; stigmas 2, capillary, setaceous.

Hab.: Bowen Downs, *C. W. de Burgh-Birch*, F. v. *Mueller*; Muckadilla, *Mrs. Geo. Trenouth*; St. George, *J. Wedd*.

3. ***A. divaricata*** (spreading), *R. Br. Prod.* 410; *Benth. Fl. Austr.* v. 200. A diffuse or divaricately branched shrub, glabrous and somewhat glaucous like *A. muricata*, but usually more compact and more densely beset with the prickles of the perianths. Leaves linear-terete, mucronate-acute, often above  $\frac{1}{2}$  in. long. Fruiting perianth closely sessile with a broad oblique base, 1 to  $1\frac{1}{2}$  line long, with 3 or 4 very unequal divaricate spines, rather finer than in *A. muricata*, the longest often  $\frac{1}{2}$  in. long, but sometimes none above  $\frac{1}{4}$  in., the smallest only 1 to 2 lines, the fourth when present very slender and small; lobes of the perianth usually erect, connivent, minutely ciliate.—F. v. M. *l.c.* *Sal. Pl.* 77; *A. erinacea*, *Moq.* in *DC. Prod.* xiii. ii. 122; *A. tricuspis*, F. v. M. in *Trans. Vict. Inst.* 1855, 133, and in *Hook. and Kew Journ.* viii. 204.

Hab.: Suttor River, F. v. *Mueller*, *Bowman*; Bokhara Creek, *Leichhardt*; Darling Downs, *Lau*.

4. ***A. bicuspis*** (2-pointed), *F. v. M. in Trans. Vict. Inst.* 1855, 133, and in *Hook. Kew. Journ.* viii. 204; *Benth. Fl. Austr.* v. 200. A rigid stout but compactly branched shrub or undershrub, frequently not above 6 in. high

and quite glabrous. Leaves linear, semiterete, acute, from  $\frac{1}{4}$  in. to above  $\frac{1}{2}$  in. long. Flowers closely sessile and semi-adnate as in the preceding species but longer. Fruiting perianth 2 to 3 lines long, the tube ovoid, very hard, with 3 diverging spines, of which 2 (either equal or unequal) varying from  $\frac{1}{4}$  to 1 in. long, the third small, sometimes reduced to a tubercle, sometimes 1 line long; perianth-lobes membranous, obtuse, erect, or inflexed. Styles 2, united to above the middle into a hard column. Pericarp usually hardened. Seed obliquely erect with a superior radicle.—F. v. M. Ic. Sal. Pl. 73.

Hab.: On the inland-Downs.

5. **A. echinopsila** (Echinops-like), *F. v. M. Fragm.* vii. 14; *Benth. Fl. Austr.* v. 201. A much-branched diffuse or prostrate undershrub, spreading to above 1 ft. diameter, the branches ascending to near 6 in., or sometimes the whole plant not exceeding 2 or 3 in., glabrous and somewhat glaucous, or very rarely the young shoots slightly pubescent. Leaves narrow-linear, semiterete, mucronate-acute or obtuse, mostly about  $\frac{1}{4}$  in., rarely  $\frac{1}{2}$  in. long. Flowers very small, closely sessile, with an oblique base. Styles 2, united to the middle into a column hardened at the base. Fruiting perianth hard, scarcely 1 line long, the tube often produced below its insertion into a small protuberance or short spur; lobes 5, short, membranous, with 5 dorsal radiating unequal spines slightly connected in a ring round the summit of the tube, the longest rarely above 1 line long. Seed vertical or slightly oblique, with a superior radicle.—F. v. M. Ic. Sal. Pl. 69; *Echinopsilon anisacanthoides*, F. v. M. in *Trans. Phil. Inst. Vict.* ii. 76.

Hab.: Desert of the Suttor, *F. v. Mueller*; Crocodile Creek, Bowman; Rockhampton, O'Shanesey.

# 10. THRELKELDIA, R. Br.

(After Dr. C. Threlkeld).

(*Osteocarpus*, *F. v. Muell.*)

Flowers hermaphrodite. Perianth urceolate or cylindrical, hard when in fruit, with 4 or 5 short membranous lobes, without any dorsal appendages or in one species with 5 small erect spines. Stamens 5 or fewer. Styles 2 or 3, connate at the base. Fruit enclosed in the perianth, more or less depressed. Pericarp membranous. Seed horizontal, oblique or vertical. Testa membranous; embryo annular or nearly so, surrounding a mealy albumen; radicle ascending or level with the cotyledonar end or descending.—Diffuse procumbent or trailing undershrubs, quite glabrous or in one species scabrous. Leaves narrow, alternate. Flowers solitary in the axils, closely sessile, but not obliquely adnate as in *Anisacantha*. Bracts none.

The genus is limited to Australia. It has the hard perianth of *Sclerolena* and *Anisacantha*, but has either no spines or (in one species) very short erect ones, and differs moreover from the former in the want of any cottony wool, and from the latter in the seed. If, however, slight differences in the perianth and seed are taken into account, the species might be regarded as forming genera.—*Benth.*

Perianth with a large hollow base below the fruit.

Perianth 1 to  $1\frac{1}{2}$  line long, with 5 small dorsal erect spines. Seed

horizontal . . . . .	1. <i>T. brevicuspis</i> .
Perianth 4 to 5 lines long. Seeds vertical . . . . .	2. <i>T. proceriflora</i> .

1. **T. brevicuspis** (short-pointed), *F. v. M.*; *Benth. Fl. Austr.* v. 198. A small glabrous undershrub with slender ascending branching stems not above 6 in. Leaves narrow-linear, semiterete, acute, under  $\frac{1}{2}$  in. long. Perianth very small and campanulate when in flower. Styles 2, connate to the middle. Fruiting perianth urceolate, about  $1\frac{1}{2}$  lines long, hard when dry, with 5 erect nearly equal dorsal spines shorter than the tube and connected by a narrow horizontal ring, constricted under the spines, the whole of the part below the constriction consisting of a hollow base, 10-ribbed outside, closed inside

under the fruit, and again closed inside over the fruit, the short membranous lobes erect within the base of the spines. Fruit very flat within the base of the spines. Seed horizontal, with an annular embryo.—F. v. M. Ic. Sal. Pl. 67; *Anisacantha breviscupis*, F. v. M. Fragn. iv. 150; *Kentropsis breviscupis*, F. v. M. l.c.

Hab.: Armadilla, W. Barton; Cape River, Bowman; and other inland localities.

2. **T. proceriflora** (flowers long), F. v. M. Fragn. viii. 38. A glabrous glaucous plant, with hard branches. Leaves 5 to 10 lines long and  $\frac{1}{2}$  line broad, linear, fleshy, acute. Flowers solitary, axillary. Perianth elongated at length 4 to 5 lines long and scarcely a line thick, slightly contracted in the lower part; scales at the mouth 5, minute, membranous ciliate. Seeds vertical; radicle superior. Albumen conspicuous.

Hab.: Thomson River, C. W. de Burgh-Birch (F. v. M.).

### 11. TECTICORNIA, Hook. f.

Flowers hermaphrodite, in the axils of the cone scales, in pairs or more, free or coherent. Perianth tubular, very flaccid, lacerated at the mouth. Stamen 1, filament flattened. Anther linear-oblong, deeply 2-lobed, exserted. Ovary ovoid-lanceolate, compressed, elongated into a subulate style, 2-fid at the end; ovule subsessile. Utricle ovoid, pericarp very thin, hyaline. Seed erect, ovoid-oblong, much compressed, testa thin, coriaceous, pale-brown papillous. Albumen hard. Embryo dorsal, slender, semi-annular. Cotyledons superior, radicle inferior.—Herbs almost leafless, erect or procumbent, glaucous, cones terminal, solitary or in two or threes, oblong-cylindrical, obtuse, the scales in many series. Flowers minute.

1. **T. cinerea** (grey), Benth. and Hook. Gen. Pl. iii. Apparently annual, branching at the base, with several single or slightly branched ascending stems of 6 to 8 in., the whole plant of an ashy-grey colour when dry. Articles of the branches  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, slightly dilated at the top. Spikes terminal, oblong-cylindrical, rounded at both ends, very compact,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, 2 to 2 $\frac{1}{2}$  lines diameter, the articles very numerous, closely imbricate, the margins dilated into opposite semicircular scarious scales, without projecting points, but forming projecting acute lines. Flowers in threes, all apparently hermaphrodite and monandrous. Perianths immersed in and adnate to the rhachis at the base, thin and free at the top, very shortly toothed. Seed ovate, erect, but the radicle not always superior.—*Halocnemum cinereum*, F. v. M. Fragn. i. 140; *Salicornia cinerea*, F. v. M. Fragn. vi. 251; Benth. Fl. Austr. v. 203.

Hab.: Cape York, M'Gillivray; Trinity Bay, W. Hill (F. v. M.).

### 12. ARTHROCNUM, Moq.

Perianth obpyramidal, 3 to 4-angled, Stamen 1; utricle compressed, membranous. Stigmas 2 to 3. Seeds inverse, compressed; testa membranous, albumen fleshy, embryo dorsal, comma-shaped, radicle stout, inferior.—Fleshy, leafless jointed shrubs or herbs. Flowers minute, hermaphrodite, 2 to 3 together in the axils of the scales of sessile cone-like spikes, 2-bracteate.

Species few, in saline places of temperate and tropical countries.

1. **A. arbusculum** (tree-like), Moq. Chenop. Enum. 113, and in DC. Prod. xiii. ii. 152. A bushy erect shrub, from under 6 in. to 2 or rarely 3 or 4 ft. high with numerous rather slender short but intricate branches.

Articles often  $\frac{1}{4}$  in. long in the principal branches, 1 to 2 lines in the smaller ones, dilated at the top but without prominent lobes. Spikes terminal, thick, ovoid or oblong, rarely above  $\frac{1}{4}$  in. long but varying much in diameter, consisting of 2 to 6 articles deeply excavated and cupshaped at the top with more or less prominent lobes or scales. Flowers in threes, all monandrous and hermaphrodite, at first shorter than the scale but at length somewhat exserted, all cohering with each other at the base and immersed in and adnate to the article above them, with short free thin lobes, opening in fruit so that after flowering each ovary appears to be in a separate excavation of the rhachis, with a membranous fringed border. In fruit the lateral ovaries are often abortive, and the central pericarp grows out into a prominent beak (the thickened base of the styles), projecting horizontally considerably beyond the subtending scale.—Hook. f. *Fl. Tasm.* i. 316; *Arthrocnemum halocnemoides*, Nees in *Pl. Preiss.* i. 632; Moq. in *DC. l.c.*; *Salicornia arbuscula*, R. Br. *Prod.* 411; Benth. *Fl. Austr.* v. 203.

Hab.: Southern coast.

### 13. SALICORNIA, Linn.

(From *sal*, salt, and *cornu*, a horn.)

Perianth obpyramidal, 3 to 4-toothed, fruiting spongy. Stamens 1 to 2; utricle included in the spongy perianth, membranous; stigmas subulate. Seeds erect, compresse<sup>d</sup>; testa hispid with hooked hairs. Albumen none. Embryo conduplicate, radicle inferior, parallel to the folds of the cotyledons. Herbs or shrubs with the habit of *Arthrocnemum*, but with the flowers sunk in cavities of the joints.

Species few, of tropical and temperate parts.

- |                                                                                                                                                  |                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Flowers in threes, all or the central one hermaphrodite. Spikes continuous, the margins of the articles broad-obtuse and not prominent . . . . . | 1. <i>S. leiostachya</i> . |
| Flowers in threes, unisexual. Articles of the spikes with prominent 2-lobed margins . . . . .                                                    | 2. <i>S. tenuis</i> .      |
| Flowers in fives or sevens, mostly hermaphrodite. Articles of the spikes with slightly prominent annular margins . . . . .                       | 3. <i>S. australis</i> .   |

1. ***S. leiostachya*** (spikes smooth), Benth. *Fl. Austr.* v. 203. A spreading much-branched shrub of 2 or 3 ft., the articles of the branches cylindrical,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, slightly thickened but not lobed at the top. Spikes numerous, nearly sessile and opposite at the nodes or terminal, cylindrical, compact,  $\frac{1}{2}$  to nearly 1 in. long; articles numerous, at first rather distinct with their obtuse margins slightly prominent, but at length very closely packed into an apparently continuous spike of 2 lines diameter, without prominent scales, the separation of the articles only marked by slightly depressed transverse lines. Flowers in threes, wholly immersed and closely packed side by side, all hermaphrodite and monandrous, but often only the central one perfecting its seed. Perianths thickened upwards, with a narrow triangular obliquely truncate top. Seed apparently compressed and vertical but not seen very perfect.

Hab.: Northern localities.

2. ***S. tenuis*** (slender), Benth. *Fl. Austr.* v. 204. A divaricately-branched or diffuse shrub, more slender than the other Australian species. Articles of the branches  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, the upper end dilated into a membranous sometimes scarious margin. Flowers apparently dioecious, both sexes in threes. Male spikes short, but only commencing to flower in the specimens seen, probably at length elongated, the articles larger and broader than in the females, with scarious margins. Perianths all three distinct and slender, with 1 stamen in each, and no trace of pistil. Female spikes slender, 1 to 2 in. long, the articles  $\frac{1}{2}$  to above 1 line long. Perianths free, at first almost in a line, at length in a

triangle, clavate, turbinate, when in fruit white, much dilated at the top which is obliquely truncate and flat, each of the three containing a perfect vertical seed.

Hab.: Inland southern localities.

3. **S. australis** (southern), *Soland. in Forst. Prod.* 88 (*name only*); *Benth. Fl. Austr.* v. 205. Stems procumbent, hard, sometimes woody at the base, with ascending or erect branches rarely above 6in. high, the articles varying from a little more than  $\frac{1}{4}$  to above  $\frac{1}{2}$  in. high, not much or not at all dilated at the end and either quite terete or obscurely 2-lobed. Spikes cylindrical, 1 to 2in. long, usually thicker than the stems, the articles about 1 line long, dilated at the top into slightly prominent rings but not lobed. Flowers 5 or 7 together side by side, all hermaphrodite or the ovaries of the lateral ones abortive, mostly if not all diandrous. Perianths free and distinct, shortly immersed at the base, the central ones rather longer than the lateral, but all shortly prominent beyond the subtending ring, clavate, obliquely truncate and flat at the top and almost closed by the minute connivent teeth.—*S. indica*, R. Br. *Prod.* 411; *Hook. f. Fl. Tasm.* i. 317, not of Willd.

Hab.: Fitzroy River and south.

#### 14. SUÆDA, Forsk.

(From *Suad*, an Arabic word for a plant yielding soda).

(*Chenopodina*, Moq.)

Flowers mostly hermaphrodite. Perianth depressed-globular, herbaceous or slightly fleshy, with 5 broad lobes connivent over the fruit, without appendages or with a slight horizontal protuberance or thick scale on the back at the base of each lobe. Stamens 5. Styles 2 or 3, rarely more; free or shortly united at the base. Fruit enclosed in the perianth; pericarp membranous, very thin but separable from the seed. Seed flat, horizontal or vertical; testa crustaceous with a thin inner membrane. Embryo flat, spirally twisted, without any or with scarcely any albumen.—Glabrous herbs or undershrubs. Leaves alternate, sessile, linear, thick or terete. Flowers small, sessile, solitary or clustered in the axils. Bracts and bracteoles very small and scarious.

The genus, consisting of a small number of species, is widely diffused over the sea coasts and saline districts of both the New and the Old World, the only Australian species being the most common one over nearly the whole area of the genus.—*Benth.*

1. **S. maritima** (maritime), *Dumort. Fl. Belg.* 22 (*Moq.*); *Benth. Fl. Austr.* v. 206. A much-branched herb, erect and attaining 1ft. or more, or low and spreading, quite glabrous, somewhat succulent, with a hard almost woody base, but usually annual or biennial. Leaves linear-terete or semi-cylindrical, usually acute,  $\frac{1}{2}$  to above 1in. long. Flowers very small, clustered or rarely solitary in the axils, the fruiting perianth usually about 1 line diameter, with a very flat horizontal seed, but occasionally is found one perianth in the cluster narrower with a vertical seed. Under each flower there are usually 1 bract and 2 bracteoles, all small transparent scales, but sometimes one of the three is wanting. Seed shining.—*Hook. f. Fl. Tasm.* i. 316; *F. v. M. Ic. Sal. Pl.* 89; *Chenopodina maritima*, Moq. in *DC. Prod.* xiii. ii. 161; *Chenopodium australe*, R. Br. *Prod.* 407; *Suada australis*, Moq. in *Ann. Sc. Nat. ser. 1*, xxiii. 318; *Chenopodina australis*, Moq. in *DC. Prod.* xiii. ii. 163.

Hab.: Cleveland Bay, Bowman; Fitzroy River, Thozet; and many other localities.

The species is common on the sea coasts of most temperate and subtropical regions both in the New and the Old World. The Australian plant is usually distinguished from the common northern one by its suffrutescent habit, but it is doubtful whether its duration exceeds the second year, which the European plant is said frequently to attain. In both, the base of the stem becomes very hard and more or less woody.—*Benth.*

15. **SALSOLA**, Linn.(Salt marsh plant, a diminutive from *salsus*, salted).

Flowers hermaphrodite. Perianth of 5 rarely 4 distinct segments when in fruit, bearing each on their backs a horizontal wing or protuberance, their points closed over the fruit. Stamens 5 or rarely fewer. Styles 2, rarely 3, united at the base or above the middle. Fruit enclosed in the perianth. Pericarp membranous. Seed depressed or nearly globular, testa membranous; embryo coiled in a conical or doubly convex spire, without albumen.—Herbs or undershrubs usually hard or fleshy. Leaves narrow-linear or terete, entire. Flowers axillary, sessile, solitary within each floral leaf (or subtending bract), with 2 opposite bracteoles.

The genus is widely spread over the temperate regions of the globe in more or less saline situations. The only Australian species is the most common one over nearly the whole area of the genus.—*Benth.*

1. **S. Kali**, Linn.: *Moq. in DC. Prod.* xiii. ii. 187. A hard procumbent or divaricately-branched herb, glabrous or slightly pubescent, usually under 1 ft. but sometimes extending to 2 ft. Leaves alternate or rarely here and there opposite, sessile, hard and rigid in the typical form, the lower ones terete or dilated at the base, from  $\frac{1}{2}$  in. to above 2 in. long, the upper ones shorter, thicker, and often more flattened above, but sometimes all terete, the lower floral ones similar to the stem-leaves, the upper ones gradually smaller and sometimes, especially on side branches, reduced to thick triangular or lanceolate bracts not exceeding the calyx, all as well as the bracteoles ending in rigid pungent points. Flowers sessile and solitary in the axil of each bract, but often, owing to the reduction of the flowering branch, clustered in the axils of the primary floral leaves. Bracteoles similar to the floral leaf or subtending bract, but usually smaller. Segments of the fruiting perianth forming at the base a hard or thin campanulate or turbinate tube rarely much above 1 line long, surrounded at the top by the 5 horizontal wings which are either all equal or 2 narrower than the others, each one sometimes 2 lines long and broad, thin and scarious, sometimes very small and thick or in some flowers scarcely perceptible, the summit of each perianth-segment within the wing acute scarious and closing over the fruit. Pericarp with the upper portion flat circumsciss and deciduous. Embryo spiral, the two cotyledons in separate coils one over the other, with the radicle coiled horizontally round the lowest coil or between the two.—*S. australis*, R. Br. *Prod.* 411; *Moq. in DC. Prod.* xiii. ii. 188; *S. macrophylla*, R. Br. l.c.; *Moq. l.c.* 187; *Nees in Pl. Preiss.* i. 637; *F. v. M. l.c. Sal. Pl.* 90.

Hab.: Bay of Inlets, *Banks and Solander*; Maria Island, *Dallachy*; in the interior, *Mitchell*; Cape and Suttor Rivers, *Bowman*; Armadilla, *W. Barton*; Curriwilloughie, *Dalton*.

The species is widely distributed over the temperate regions of the New as well as the Old World in more or less saline districts, extending not infrequently to within the tropics. I can discover nothing to separate the Australian specimens from the European form even as a variety. Moquin cites both as growing together in Timor.—*Benth.*

Var. *leptophylla*. Leaves slender, almost filiform, but pungent when full grown.

Var. *strobilifera*. Flowers densely clustered in globular heads with the points of the subtending bracts protruding like the scales of a pine-cone.

Var. *brachypteris*. Wings or appendages of the perianth reduced to prominent transverse ribs, in all or nearly all the flowers.—*S. brachypteris*, *Moq. in DC. Prod.* xiii. ii. 189.—Rockingham Bay, *Dallachy*; Curtis Island, *Thozet*. The size of the perianth-wings is as variable in European as in Australian specimens, and in some flowers of most specimens and in nearly all of other specimens they remain, in both countries, very short or undeveloped as in *S. brachypteris*; in this state *S. Kali* can always be readily distinguished from *S. Soda* by the pungent leaves.

16. **BOUSSINGAULTIA**, H. B. and K.

(After J. B. Boussingault.)

Flowers hermaphrodite, pedicels articulate with 2 ovate bracteoles at the top, the basal bract subulate. Perianth membranous, 5-parted, tube short, segments



oblong, obtuse, concave, patent. Stamens 5, inserted in the throat of the perianth-tube, filaments filiform-subulate reflexed in the bud; anthers oblong, versatile. Ovary ovoid, umbonate, style straight or flexuose, stigmatic lobes or stigmas clavate. Utricle included in the perianth, globose, umbonate at the apex, stipitate. Seeds erect, subreniform. Embryo semiannular, clavate; albumen farinose; cotyledons broad plano-convex; radicle thick descendent. Glabrous twiners. Leaves alternate fleshy, entire. Flowers small, in axillary or terminal racemes. Bracts persistent or deciduous; the bracteoles below the flowers adnate to the pedicel or caducous.

Species about 10. Tropical America.

1. **B. baselloides** (Basella-like), *Humb. and Kunth*. Lambs' Tails. Rhizome knotted, fleshy. Stems twining from left to right, glabrous. Leaves fleshy, alternate, jointed on the stem, cordate, acute, 1 to 4 in. long on petioles of 1 in., compressed. Racemes pendent several inches long. Flowers fragrant, white. Pedicels with a small subulate bract at the base, and 2 small ovate bracteoles at the base of the flower. Perianth thin, deeply cut into 6 oval soon reflexed segments, of which 3 are more external; often there are 1 or 2 large scales or segments on the outside of these. Stamens 6, inserted at base of segments, opposite to them; filaments subulate, spreading. Anthers shortly oblong, opening by 2-clefts. Ovary ovate.—*Bot. Mag.* t. 3620.

Hab.: Naturalized near towns.

## ORDER CII. PHYTOLACCACEÆ.

Perianth of 5 rarely 4 divisions or lobes, either all herbaceous or scarious or petal-like on the margins or coloured inside, imbricate in the bud. Stamina (or petals?), in a few genera not Australian, 5 or fewer, minute and stipitate. Stamens as many as perianth-divisions and alternate with them or more numerous, inserted on the torus or at the base of the perianth; anthers 2-celled, the cells parallel, opening by longitudinal slits. Ovary either of a single somewhat excentric carpel, or of several carpels either distinct or united in a ring round the centre of the torus or, in a genus not Australian, forming a single 1-celled ovary with the ovules in a ring round a central column. Ovules solitary in each carpel, ascending, amphitropous or anatropous. Styles as many as carpels, proceeding from their upper inner angle, free or united at the base, stigmatic along their inner edge. Carpels of the fruit variously enlarged, free or united, dry or succulent, indehiscent or dehiscent along their inner or outer edge or both. Seed ascending, sometimes accompanied by a small arillus or strophiole; testa membranous or crustaceous. Albumen mealy or somewhat fleshy, copious, scanty, or sometimes none. Embryo usually much curved, rarely folded or straight; cotyledons narrow or broad and convolute; radicle inferior.—Herbs, undershrubs, or rarely shrubs or trees, usually glabrous. Leaves alternate, usually entire. Flowers hermaphrodite or unisexual, in terminal axillary or leaf-opposed spikes racemes or clusters, rarely solitary, usually accompanied by a subtending bract and 2 bracteoles.

The Order is chiefly American and African, a very few species extending into Asia, as weeds of cultivation or otherwise introduced. The Australian genera are all endemic.

TRIBE I. **Rivineæ**.—Flowers hermaphrodite, rarely unisexual. Perianth 4 to 5-parted. Ovary monocarpous. Fruit indehiscent. Cotyledons plicate-convolute.

Perianth-segments 4, small, equal. Stamens 4. Style short. Stigma capitate.

Fruit globose, red . . . . . 1. **\*RIVINA**.

Flowers unisexual. Fruit subglobose. Fruit a burr with hooked bristles . . . 2. **MOXOCOCUS**.

TRIBE II. **Euphytolacceæ**.—Flowers often hermaphrodite. Perianth 4 to 5-parted. Ovary of 2 or more carpels. Fruit fleshy, very rarely capsular. Testa membranous or crustaceous, smooth. Embryo annular, cotyledons narrow. Flowers racemous, rarely thyrsoid.

Perianth equal. Carpels sessile, free or connate, indehiscent at maturity.

Testa coriaceous . . . . . 3. \*PHYTOLACCA.

TRIBE III. **Gyrostemoneæ**.—Flowers unisexual. Perianth entire or lobed. Ovary of 1 or many carpels, carpels connate. Fruit dry. Testa transversely-rugose. Embryo annular or hamate, cotyledons very often narrow. Flowers axillary or racemose.

Perianth obconical. Carpels numerous, separating at maturity and opening

on the inner edge only . . . . . 4. CODONOCARPUS.

### 1 \*RIVINA, Linn.

(After A. Q. Rivinus.)

(Pierce, Mill.)

Flowers hermaphrodite racemose. Perianth corolla-like, 4-parted; segments subequal, obovate-oblong, obtuse, concave, coloured, unchanged, erect or spreading under the fruit. Stamens 4, hypogynous, alternate with the perianth-segments. Filaments filiform; anthers oblong, erect. Ovary subglobose, compressed, 1-celled. Style subterminal, short, curved, stigma capitate. Seeds globose-lenticular, testa crustaceous, smooth or rugose.—Herbs or undershrubs. Leaves alternate.

1. **R. lævis** (smooth), Linn. A weak undershrub, sometimes attaining 3 or more feet high. Leaves on slender petioles, ovate, acuminate. Racemes 3 or 4 in. long. Fruit small, red.

Hab.: South America; met with as a stray from garden culture. The fruit, in America, said to be the principal food of the thrush and nightingale.

Plant used as a febrifuge in Ceylon.—Trimen.

### 2. MONOCOCCUS, F. v. M.

(Fruit a single carpel.)

Flowers unisexual, monœcious or diœcious. Perianth of 4 distinct divisions. Stamens in the males 10 to 20, filaments filiform; anthers oblong-linear. Ovary in the females of a single carpel; style very short, hooked, and decurrent in a bearded line along the inner edge of the carpel. Fruit dry, indehiscent, covered with hooked bristles. Seed with a thin testa; albumen unilateral; embryo transversely folded, the cotyledons broad and convolute.—Shrub. Leaves membranous. Flowers in racemes either terminal or in the upper axils, the males usually in separate racemes or on separate individuals, but sometimes a few females at the base of the male racemes or a few males at the summit of the female racemes.

The single species known is endemic in Australia.

**M. echinophorus** (bearing echinate fruits) F. v. M. *Fragm.* i. 47; *Benth. Fl. Austr.* v. 144. A straggling shrub, sometimes more erect and attaining 5 or 6 ft. Leaves petiolate, from ovate to lanceolate, obtusely acuminate, contracted at the base, membranous, 2 to 4 in. long. Racemes slender, often 5 or 6 in. long. Flowers rather distant, shortly pedicellate, each within a lanceolate acute bract shorter than the calyx and often shortly adnate to the base of the pedicel. Bracteoles 2, small, close under the perianth. Divisions of the perianth membranous, very thin, about 1 line long, obtuse. Filaments rather shorter than the anthers, often connate at the base in a short column when there is no rudiment of the ovary, rarely free round a rudimentary or imperfect ovary. Female flowers usually without stamina or staminodia. Ovary of a single oblique carpel, the straight

inner (stigmatic ?) edge densely bearded and terminating in a small hooked style, the back and sides of the carpel echinate with rigid hooked bristles. Fruiting carpel about 2 lines long without the long hooked bristles with which it is covered, forming an adhesive burr.

Hab.: Port Denison, *Fitzalan*; Edgecombe Bay, *Dallachy*; Broadsound, *Bowman*; Rockhampton, *Thozet*, *O'Shanesy*; Brisbane River, Moreton Bay. *W. Hill*, *F. v. Mueller*.

### 3. \*PHYTOLACCA, Linn.

(The names refers to the coloured juice of the fruit.)

Flowers 1 to 2-sexual. Sepals 4, oblong, obtuse. Stamens 5 to 25. Carpels 5 to 10, free or connate, fleshy in fruit. Seed reniform, compressed, exarillate, albumen floury; embryo annular, cotyledons slender, radicle ascending.—Shrubs or herbs, rarely trees. Leaves exstipulate.

Species tropical and subtropical.

1. **P. octandra** (stamens eight), *Linn.*; *Benth. Fl. Austr.* v. 143. Red Ink Plant. An erect soft-wooded herbaceous plant, with a thick fleshy rootstock. Leaves large, ovate-lanceolate. Flowers hermaphrodite, almost sessile in pedunculate racemes, either terminal or almost leaf-opposed. Perianth small, of 6 divisions. Stamens usually 8. Carpels usually 8, united in the fruit in a depressed succulent almost black berry more or less prominently 8-ribbed.

Hab.: An American weed. Naturalized and in many places a great pest.

### 4. CODONOCARPUS, A. Cunn.

(Bell-fruit).

(*Hydnorhiza*, *F. v. Muell.*)

Flowers diœcious or monœcious. Perianth very open under the fruit, very shortly and obtusely or obscurely sinuate-toothed. Stamens in the males 10 to 20 radiating in a single series round a central disk, the anthers oblong, nearly sessile. Ovary in the females of 20 to 50 carpels connate in a ring round a central column, dilated into a flat disk at the top. Styles or stigmas short or linear, free or slightly connected in a ring round the terminal disk. Fruiting carpels closely connected till near their maturity, separating when ripe from each other and from the central column and opening only along their inner edge. Seeds of adjoining carpels alternately placed near the top and below the top of the carpel, each with a small membranous aril or strophiole.—Tall shrubs or trees. Leaves linear or broad. Flowers in leafless racemes, axillary or terminal or the females on the leafless bases of the year's shoot. Bracteoles usually very small under the perianth.

The genus is limited to Australia.

Leaves lanceolate, tapering into a long point. Carpels 40 to 50 . . . . . 1. *C. australis*.

Leaves obovate to broadly lanceolate, obtuse or shortly pointed. Styles short, conical. Carpels about 20 to 30 . . . . . 2. *C. cotinifolius*.

1. **C. australis** (southern), *A Cunn. Herb.*; *Moq. in DC. Prod.* xiii. ii. 39; *Benth. Fl. Austr.* v. 148. A tree of 30ft. with a smooth bark and numerous slender flexuose branches. Leaves lanceolate, tapering into a long narrow point and contracted into a long petiole  $1\frac{1}{2}$  to 3in. long. Fruits on long pedicels along the leafless bases of axillary branches (racemes of which the axis has grown out into a leafy branch?). Perianth 2 to  $2\frac{1}{2}$  lines diameter. Fruit turbinate, almost campanulate, 7 to 8 lines long, very broad at the apex, and rather deeply depressed in the centre, the disk or dilated summit of the central column 3 to 4 lines diameter; carpels 40 to 50, quite connate when young,

their dorsal edges forming prominent ribs when approaching maturity, and finally separating completely, the sides then thin and transparent, empty and indehiscent in the lower part, broader and opening at the inner edge in the upper seed-bearing portion, but in alternate carpels close to the top or a little above the middle.—*Gyrostemon attenuatus*, Hook. Bot. Misc. i. 244, t. 53.

Hab.: Brisbane River, Moreton Bay, A. Cunningham, Fraser; Mount Mistake and other Ranges.

Wood soft and spongy and of a light colour.—Bailey's Cat. Ql. Woods, No. 304a.

2. **C. cotinifolius** (Cotinus-leaved), F. v. M. Pl. Vict. i. 200; Benth. Fl. Austr. v. 148. Usually a tall shrub or small tree, but attaining sometimes 40ft., of a pale or glaucous green. Leaves from broadly obovate or ovate to elliptical-oblong or almost lanceolate, obtuse or shortly pointed, contracted into a rather long petiole, 1 to 2in. long. Flowers diœcious or monœcious but usually the two sexes in separate racemes in the upper axils, sometimes forming a terminal panicle, the males on very short, the females on rather long pedicels. Perianth about 2 lines diameter in the females, rather smaller in the males. Stamens 15 to 20. Ovary about twice as long as the calyx, broadly turbinate, depressed in the centre, consisting of 20 to 30 or rather more carpels, the ovules in alternate carpels inserted near the top or about the middle of the cavity so as to give the appearance of biseriate cells or carpels. Styles or stigmas shortly conical and soon wearing off or falling off in a ring. Fruit obconical or obovoid, much less expanded at the top and much less depressed in the centre than in *C. australis*, about 5 lines diameter, the carpels less distinctly biseriate than when young, separating and dehiscent on the inner edge as in *C. australis*.—*Gyrostemon cotinifolius*, Desf. in Mem. Mns. viii. 116, t. 10; Moq. in DC. Prod. xiii. ii. 39; *G. pungens*, Lindl. in Mitch. Three Exped. ii. 121; *G. acaciiformis*, F. v. M. in Linnaea, xxv. 439.

Hab.: Recorded for Queensland by F. v. M.

## ORDER CIII. POLYGONACEÆ.

Perianth-segments 6, 5 or fewer, free or shortly united at the base, imbricate in the bud and more or less in 2 rows, regular and equal or the inner ones enlarged. Stamens variable in number, usually 9, 8, 6 or fewer, alternate with the perianth-segments or having no definite relation to them; anthers with 2 parallel cells. Ovary free, with a single erect orthotropous ovule. Styles or style branches 2, 3 or rarely more, the stigmas terminal, capitate, or dilated, entire or fringed. Fruit a small seed-like nut, usually with as many angles as styles, enclosed in or scarcely protruding from the persistent perianth. Seeds erect, with a membranous testa. Embryo in a mealy albumen, straight or central and more frequently curved and lateral; radicle superior.—Herbs shrubs woody climbers or rarely, in species not Australian, trees. Leaves alternate. Stipules usually thin and scarious, brown or silvery, forming a sheath or ring round the stem. Flowers small, herbaceous or coloured, clustered in the axils of the leaves, or within small sheathing bracts or even without bracts along the rhachis of simple or paniculate spikes or racemes, without bracteoles on the pedicels.

A considerable Order dispersed over every part of the globe.

TRIBE I. **Eupolygoneæ**.—Herbs or undershrubs. Leaves alternate, the ocrea or stipular-sheath scarious-membranous. Perianth 5-merous rarely 4-merous. Stamens 1 to 8 rarely more. Styles often filiform, stigma capitate.

Flowers mostly hermaphrodite. Style or style-branches 2 to 3; stigmas entire 1. POLYGONUM.

TRIBE II. **Rumiceæ**.—Herbs, rarely undershrubs or shrubs. Leaves alternate or radical ocrea membranous-scarious. Perianth 6 or rarely 4-merous. Stamens 9 or very rarely sometimes fewer. Styles short recurved-spreading, stigmas imbricate, peltate or horseshoe-shaped.

Perianth 6-merous. 3 inner enlarged in fruit (except *R. acetosella*). . . . 2. RUMEX.

TRIBE III. **Coccolobææ**.—Trees, shrubs or rarely undershrubs, the stems sometimes climbing. Leaves alternate, ocrea various, often very short or almost obsolete. Inflorescence axillary or terminal. Perianth 5-merous. Stamens 8 or fewer. Stigmas various. Albumen longitudinally sulcate, 3 to 6-lobed and very frequently ruminant.

Flowers more or less diœcious. Styles or style-branches 3; stigmas more or less fringed or rarely entire . . . . . 3. *MCHLENBECKIA*.

# 1. POLYGONUM, Linn.

(Stems much-jointed.)

Flowers usually hermaphrodite. Perianth of 5, rarely fewer segments, all equal or the 2 or 3 outer ones enlarged. Stamens 5 to 8, varying often in the same species. Styles or style-branches 2 or 3, with entire terminal stigmas. Nut flattened or triangular, enclosed in or surrounded by the persistent perianth. Embryo lateral, more or less curved, the radicle superior.—Herbs varying much in habit. Stipules in the majority of species thinly scarious, closely sheathing, the lower portion adnate to the petiole, the greater part connate within it; in the section *Aricularia* looser jagged and silvery. Flowers small, pale green or red with white edges, either clustered or rarely solitary in the axils, or in little clusters within a sheathing bract arranged in simple or paniculate spikes.

A large genus, with almost the cosmopolitan range of the Order.

(Arranged according to Hook. in Fl. Brit. Ind.).

SECT. I. **Avicularia**, Meissn.—Erect or prostrate herbs, rarely undershrubs or shrubs. Leaves small; stipules tubular hyaline cleft or torn. Flowers in axillary clusters, bracts tubular. Perianth 4 to 5-cleft. Stamens 3 to 8, very short. Styles 3, minute, free. Nuts 3-gonous. Albumen honey, cotyledons incumbent.

Stems elongated and wiry. Perianth about 1½ line long. Nut minutely granular-striate . . . . . 1. *P. ariculare*.

Stems short and compact. Perianth under 1 line long. Nut smooth and shiny . . . . . 2. *P. plebeium*.

SECT. II. **Amblygonon**, Meissn.—Erect or ascending herbs. Leaves large; stipules with often a dilated mouth. Flowers in cylindric spikes or racemes; bracts tubular. Perianth 4 to 5-partite. Stamens 5 to 8, alternating with glands. Style 2 to 3 short, stigmas capitate. Nuts orbicular, compressed. Embryo slender, cotyledons narrow incumbent.

Stipules, at least the lower ones, dilated and green at the top . . . . . 3. *P. orientale*.

Stipules all closely sheathing and scarious at the top . . . . . 4. *P. attenuatum*.

SECT. III. **Persicaria**.—Erect or decumbent unarmed often glandular, annuals or perennials. Leaves narrow. Flowers in slender or dense-spiceiform racemes; bracts tubular.

Spikes solitary, mostly axillary. Stem prostrate . . . . . 5. *P. prostratum*.

Spikes terminal, long, slender and interrupted, usually single. Stems slender, erect. Perianth densely glandular-dotted . . . . . 6. *P. hydropiper*.

Spikes usually continuous and 2 or more in a terminal panicle. Perianth without any or with few glandular dots. Stems erect or ascending. Stipules bordered by bristles usually long, at least the upper ones.

Glabrous. Spikes few and slender . . . . . 7. *P. minus*.

Strigose-hirsute. Spikes slender, pedunculate. Leaves nearly sessile . . . . . 8. *P. subsessile*.

Strigose-hirsute. Spikes compact, on short peduncles. Bristles of the stipules very long . . . . . 9. *P. barbatum*.

Stipules truncate, without any or with a few fine short cilia. Strigose hirsute. Spikes compact . . . . . 10. *P. articulatum*.

Glabrous or nearly so . . . . . 11. *P. lapathifolium*.

Cottony-white . . . . . 12. *P. lanigerum*.

SECT. IV. **Echinocaulon**.—Erect or ascending usually prickly annuals. Leaves usually broad, often hastate. Flowers capitate or in racemes, bracts tubular.

Stems weak with reflexed bristles on the angles of the branches . . . . . 13. *P. strigosum*.

SECT. V. **Tiniaria**.—Twining herbs. Leaves broad, hastate or cordate. Flowers in axillary clusters or slender racemes; bracts not tubular.

Annual, prostrate or twining, leaves sagittate-cordate. The 3 outer sepals

obtusely keeled, pedicels jointed above the middle . . . . . 14. *P. convolvulus*.

*Muhlenbeckia Cunninghamii* has almost the styles and stigmas of *Polygonum*, but the flowers are dioecious.—Benth.

1. ***P. aviculare*** (bird-food), Linn. Meissn. in DC. Prod. xiv. 97; Benth. Fl. Austr. v. 267. A glabrous annual, much branched at the base, sometimes erect or ascending when young, but the stems soon prostrate, wiry, extending to 1 or 2 ft. or even more. Leaves shortly petiolate, elliptical oblong lanceolate or rarely linear, the larger ones above lin. long but mostly smaller. Stipules broad, more or less brown at the base, the remainder silvery and split into finely pointed lobes. Flowers axillary, solitary or in clusters of 2 to 5, very shortly, pedicellate. Fruiting perianth above 1 line long, the segments green in the centre, white on the margins. Styles 3. Nut triangular, black but opaque (not shining) owing to a minute granulation visible under a strong lens.

Hab.: Common in southern localities, also in Europe and Asia.

2. ***P. plebeium*** (low), R. Br. Prod. 420; Benth. Fl. Austr. v. 267. A much branched prostrate annual, much more compact than *P. aviculare*, and rarely above 1 ft. long, glabrous or the branches slightly hoary. Leaves linear, narrow-oblong or slightly spatulate, rarely above  $\frac{1}{2}$  in. long. Stipules as in *P. aviculare* short silvery and ragged at the edges. Flowers very small, in clusters of 2 to 5 in the axils of most of the leaves. Fruiting perianth under 1 line long, the segments green, with a narrow white edge. Nuts triangular, very smooth and shining.—Meissn. in DC. Prod. xiv. 94; Benth. Fl. Hongk. 287, with the synonyms there adduced.

Hab.: Broadsound, R. Brown; Brisbane River, Moreton Bay, A. Cunningham, F. v. Mueller and others; Gilbert River, F. v. Mueller; Rockhampton, O'Shanesy; Wide Bay, Bidwill; Kennedy District, Daintree.

Exceedingly common all over tropical Asia, extending into Africa. Very near *P. aviculare*, but amidst all its variations it seems to me constantly to differ from that species in its compact habit and small flowers, and in the nuts always smooth and shining.—Benth.

3. ***P. orientale*** (eastern), Linn.; Meissn. in DC. Prod. xiv. 123; Benth. Fl. Austr. v. 271. An erect softly pubescent or hirsute annual of 2 to 5 ft. Leaves on rather long petioles, ovate or the upper ones lanceolate, acute or acuminate, 3 to 6 in. long. Stipules very hairy, closely sheathing and scarious at the base, but all except the uppermost expanded at the top into a green spreading limb. Spikes (especially in the hirsute form) rather slender, continuous or slightly interrupted, several in a loose terminal panicle. Bracts hairy and ciliate. Flowers rather large. Stamens usually 7. Style with 2 slender branches. Nut flat or the sides convex, the margin obtuse. Radicle curved towards the back of the cotyledons.—R. Br. Prod. 420.

Hab.: Rockingham Bay, Dallachy; Rockhampton, common on the edges of lagoons, etc. Dallachy, O'Shanesy, Borman; Archer's Station, Leichhardt; Moreton Bay, C. Stuart; and many other localities, North and South.

Most of the Australian specimens belong to the var. *pilosum*, Meissn. (*P. pilosum*, Roxb.), which extends over E. India to S. China.

4. ***P. attenuatum*** (attenuated), R. Br. Prod. 420; Benth. Fl. Austr. v. 272. A tall species, very nearly allied to *P. orientale*, the stems and foliage more or less sprinkled with rather fine appressed hairs, hoary when young, or sometimes nearly glabrous. Leaves lanceolate, tapering into a very long point and contracted into a rather long petiole, mostly above 6 in. long. Stipules entirely sheathing, truncate and shortly ciliate, without the green limb of *P. orientale*. Spikes continuous,  $1\frac{1}{2}$  to 3 in. long, few on rather long peduncles in a terminal

panicle. Bracts rather thick, truncate, shortly ciliate or entire. Perianth, stamens, style, nut and embryo entirely of *P. orientale*.—Meissn. in DC. Prod. xiv. 117.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Mackay, Cooper's Creek, and other localities, North and South.

I have not identified this with any Asiatic species, but I am unable to distinguish it from the Brazilian *P. spectabile*, Mart.; Meissn. in DC. Prod. xiv. 119, and in Mart Fl. Bras. Polygon. 13. t. 3, in the seeds of which I find the radicle incumbent as in *Amblygonum*. Meissner has not figured the embryo either in this or in *P. hispidum*.—Benth.

5. ***P. prostratum*** (prostrate), *R. Br. Prod.* 419; *Benth. Fl. Austr.* v. 268. A prostrate branching perennial, often woody at the base and rooting at the lower nodes, extending to 1 or 2ft., sprinkled with slender appressed hairs or nearly glabrous. Leaves lanceolate, contracted into a short petiole 1 to 1½ or rarely 2in. long. Stipules sheathing, ciliate with a few long hairs on the back and margins. Spikes shortly pedunculate, axillary or rarely terminal, about ½in. or rarely ¾in. long, rather dense. Perianth scarcely 1 line long when in flower, slightly enlarged afterwards. Stamens 5 or 6. Style-branches 2, not enclosed in the perianth, lenticular, both sides very convex.—Meissn. in DC. Prod. xiv. 116; Hook. f. Fl. Tasm. i. 307.

Hab.: Rockhampton, *O'Shanesy*; and in southern localities.

The species is also in New Zealand.

6. ***P. hydropiper*** (water pepper), *Linn*; *Meissn. in DC. Prod.* xiv. 109. *Benth. Fl. Austr.* v. 269. A slender erect or decumbent glabrous annual, 1 to 2ft. high. Leaves lanceolate, acuminate. Stipules sheathing, rather short, ciliate at the top. Spikes slender and interrupted, often several inches long, solitary or nearly so at the ends of the stem or branches and often nodding. Perianth and often the bracts also dotted with prominent glands. Style branches usually 2. Nuts flat.—*P. gracile*, *R. Br. Prod.* 419; Meissn. in DC. Prod. xiv. 109.

Hab.: Southern localities.

The species is widely diffused over Europe, temperate and subtropical Asia and North America. I can perceive no difference between the Australian and many of the northern specimens.—*Benth.*

7. ***P. minus*** (small), *Huds*; *Meissn. in DC. Prod.* xiv. 111; *Benth. Fl. Austr.* v. 269. Rather slender, erect or decumbent, smaller and less branched than *P. lapathifolium*, rarely exceeding 2ft., quite glabrous in the typical form. Leaves shortly petiolate, lanceolate, acuminate. Stipules closely sheathing, the margins ciliate. Spikes 1 to 1½in. long, few in a terminal panicle, more slender than in *P. lapathifolium*, much less so than in *P. hydropiper*. Bracts small, naked or shortly ciliate. Perianth small, not glandular. Stamens 5 or 6. Style-branches 2 or 3, varying often in the same spike, more frequently 3 than 2.—Hook. f. Fl. Tasm. i. 306; *P. decipiens*, *R. Br. Prod.* 420; Meissn. in DC. Prod. xiv. 104.

Hab.: Brisbane, Burnett, and Burdekin Rivers, *F. v. Mueller*; Moreton Island, *M'Gillivray*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*; in the interior, *Mitchell*.

The species is very common in the temperate, subtropical, and even tropical regions of the Old World, and varies much. In Australia some specimens agree with the commonest European forms, in others, chiefly from Queensland, the ailia of the stipules are longer, there are a few small strigose hairs on the under side of the leaves; and the pistil is almost always 3-merous. These constitute probably (with corresponding European forms) the *P. serrulatum*, Lag. cited from Australia and New Zealand by Meissn. in DC. Prod. xiv. 110.—*Benth.*

8. ***P. subsessile*** (almost sessile), *R. Br. Prod.* 419; *Benth. Fl. Austr.* v. 269. A perennial with an almost woody rhizome and erect loosely branched stems attaining 2 or 3ft., the whole plant more or less strigose with appressed hairs, short on the upper side of the leaves, longer underneath. Leaves lanceolate, acuminate, mostly 3 or 4in. long, contracted into a very short petiole. Stipules

sheathing, much longer than the petiole, bordered by long cilia. Spikes rather slender, 1 to 2 in. long, usually 2 to 4 on long peduncles in a loose terminal panicle. Perianth-segments petal-like, not glandular. Stamens 5. Style-branches 2, rather long. Nut lenticular, the sides very convex.—Meissn. in DC. Prod. xiv. 113; Hook. f. Fl. Tasm. i. 306.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*; Stanthorpe.

9. ***P. barbatum*** (bearded), *Linn*; *Meissn. in DC. Prod.* xiv. 104; *Benth. Fl. Austr.* v. 270. Stems ascending or erect, glabrous or nearly so, 2 to 3 ft. high. Leaves lanceolate, contracted into a short petiole although not so short as in *P. subsessile*, 3 to 6 in. long, sprinkled with appressed hairs never wanting on the midrib underneath. Stipules sheathing, hairy outside, bordered by very long cilia. Spikes in the common form compact, 1 to 1½ in. long, on short peduncles in a narrow terminal panicle. Bracts always ciliate on the margin. Stamens 5 or 6. Style-branches (always?) 3. Nut triangular.

Hab.: Roper and Burnett Rivers, *F. v. Mueller*; Port Curtis, *M'Gillivray*; and southern localities.

The species is common in tropical Asia and Africa.

10. ***P. articulatum*** (articulate), *R. Br. Prod.* 420; *Benth. Fl. Austr.* v. 270. Erect and rather stout, the stems glabrous below, hirsute in the upper part with appressed hairs. Leaves lanceolate, tapering into long points and contracted into rather long petioles, 3 to 6 in. long, hirsute on both sides with appressed hairs short and strigose on the upper surface, longer and more silky underneath, rigid on the margins. Stipules sheathing, long and truncate, without any or only with few very short marginal cilia. Spikes few, rather dense, 1 to 2 in. long. Bracts shortly ciliate. Styles 2. Nut compressed, the sides rather convex. Curvature of the embryo in the two seeds examined rather oblique with relation to the cotyledons, but more accumbent than incumbent.—Meissn. in DC. Prod. xiv. 117; *P. australe*, *Spreng. Syst.* ii. 258.

Hab.: Broadsound and Shoalwater Bay, *R. Brown*.

I have not seen this in any other collection, and have not been able to match it with any Asiatic species. The habit is that of *P. barbatum* and *P. glabrum*, differing from the former in want of the long cilia or bristles to the stipules, from the latter in the indumentum, which is that of *P. subsessile*, from which it is removed by the long petioles and the want of cilia in the stipules.—*Benth.*

11. ***P. lapathifolium*** (*Lapathum* (*Rumex*) like), *Linn*; *Meissn. in DC. Prod.* xiv. 119; *Benth. Fl. Austr.* v. 270. Tall erect and glabrous, except sometimes very short strigose hairs on the margins and midrib of the leaves, and in some varieties a very slight hoariness on their under surface. Leaves lanceolate or ovate-lanceolate, acuminate, 6 to 8 in. long or even larger, contracted into a petiole usually exceeding the stipules, the glandular dots of the under surface more conspicuous than in many species. Stipule sheathing, without marginal bristles or rarely with a few very small cilia. Spikes rather slender, from under 1 to above 2 in. long, in a terminal branching more or less leafy panicle. Bracts small, truncate or shortly acuminate. Perianth, at least the outer segments, more or less glandular, and the prominent glands extending sometimes to the bracts and peduncles. Stamens 5 or 6. Styles short with 2 long branches. Nut very flat, the sides concave or rarely slightly convex. Radicle curved towards the edge of the cotyledons (accumbent).—*P. nodosum*, *Pers.*; *Meissn. in DC. Prod.* xiv. 118; *P. glandulosum*, *R. Br. Prod.* 419; *Meissn. l.c.* 116; *P. adenophorum*, *Spreng. Syst.* ii. 258; *P. elatius*, *R. Br. l.c.* 419; *Meissn. l.c.* 121.

Hab.: Brisbane River, *C. Stuart*; Nerook Creek, *Borman*; Armadilla, *W. Barton*.

Common in the temperate and subtropical regions of the New and the Old World, especially in the northern hemisphere.

The joints of the claws of this species are sometimes attacked with the fungus.—*Ustilago emodensis*, *Berk.*



12. **P. lanigerum** (woolly), *R. Br. Prod.* 419; *Benth. Fl. Austr.* v. 271. Stems erect, slightly branched, attaining 2 or 3ft., the whole plant white with a close woolly or arachnoid tomentum, or the upper surface of the leaves and the lower part of the stem at length glabrous. Leaves shortly petiolate, lanceolate, acuminate, 3 to 4in. long or even larger. Stipules sheathing, usually long, bordered by few fine cilia. Spikes narrow but rather dense, 1 to 1½ in. long, several in a terminal panicle. Bracts short, denticulate-ciliate. Perianth often glandular. Style short, with 2 long branches. Nut flat.—Meissn. in DC. *Prod.* xiv. 117.

Hab.: Burdekin River, *F. v. Mueller*; and other southern localities.

The species is common in E. India, and extends to S. Africa. Although nearly allied to *P. lapathifolium*, it appears constantly to differ from the var. *incanum* of that species, in the abundance of the white indumentum.—*Benth.*

13. **P. strigosum** (bristly), *R. Br. Prod.* 420; *Benth. Fl. Austr.* v. 268. Stems weak, erect or straggling, 2 to 3ft. long, with reflexed bristles on the angles of the branches and on the petioles and midribs of the leaves, and a short glandular pubescence on the peduncles, otherwise the whole plant glabrous. Leaves petiolate, lanceolate, acuminate, hastate, or broadly sagittate at the base, the larger ones 2 to 4in. long. Stipules sheathing, shortly ciliate-toothed or entire. Peduncles axillary, loosely dichotomous, usually longer than the leaves, the branches terminating in short rather dense but few-flowered spikes. Bracts denticulate and ciliate, nearly 2 lines long. Perianth-segments about 1½ line long, slightly enlarged when in fruit, completely enclosing the smooth nut. Style branches and angles of the nut more frequently 3 than 2.—Meissn. in DC. *Prod.* xiv. 134; *Hook. f. Fl. Tasm.* i. 307; *P. pedunculare*, Wall.; Meissn. l.c. 133; *P. muricatum*, Meissn. l.c.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller*; Rockingham Bay, *Dallachy*.

The species extends over the Archipelago and Eastern India to S. China, varying with the spikes dense or slender and interrupted, and with the pistils 2-merous or 3-merous on the same plant.—*Benth.*

14. **P. \*Convolvulus** (plant resembling a *Convolvulus*), *Linn.: Boiss. Orient.* iv. 1032; *Hook. in Fl. Brit. Ind.* v. 53. A prostrate or twining annual, 1 to 4ft. long, angles puberulous. Leaves sagittate-cordate, 1½ to 4in. long, gradually acuminate; angles obtuse or acute, puberulous beneath; petioles slender. Racemes sub-erect, short, slender; pedicels recurved, short, jointed above the middle. Perianth segments obtuse, whitish. Nuts blackish, scarcely 1 line long.—*Ql. Agri. Journ.* vii. pl. lx.

Hab.: Asia, Europe and Africa, now a pest of many countries.

## 2. RUMEX, Linn.

(Name of unknown origin.)

Flowers hermaphrodite or unisexual. Perianth of 6 segments, the three inner ones enlarged after flowering and closing over the fruit, the three outer much smaller, narrower and recurved. Stamens 6. Style 3, shortly filiform, with large fringed stigmas. Nut triangular, enclosed in the persistent perianth. Embryo lateral, the radicle superior.—Herbs or rarely, in species not Australian, shrubs, usually glabrous. Flowers small, herbaceous or the males petal-like, all often turning red, usually on recurved pedicels, in whorl-like clusters, either axillary or in terminal racemes or panicles. Stipules sheathing, scarious, usually brown, at first entire but almost always very soon torn or jagged.

A considerable genus, widely distributed over most parts of the globe, but more especially in temperate regions and a few species are amongst the roadside weeds which the most readily establish themselves in new countries.

TRIBE I. **Lapathum**.—Flowers all or mostly hermaphrodite, styles terminal; valves enlarged often bearing a grain-like callosity on the back. Leaves never hastate, pinnately-veined, rarely very acid.

Inner perianth-segments with entire margins, one or all bearing a tubercle on the midrib.

Inner perianth-segments broad, mostly cordate. Panicle dense with short crowded branches . . . . . 1. *R. crispus*.

Inner perianth-segments narrow. Panicle with elongated branches, the clusters of flowers distant . . . . . 2. *R. conglomeratus*.

Inner perianth-segments bordered by long teeth.

Flower clusters distant along the branches, without floral leaves except to the lower one.

Teeth of the inner perianth-segments five, with revolute points . . . . 3. *R. Brownii*.

Teeth of the inner perianth segments 2 to 4 unequal . . . . . 4. *R. \*obtusifolius*.

Floral leaves all longer than the flowers.

Branches erect. Flowers numerous and very small in dense clusters.

Fruiting perianth small, with a tubercle on each segment . . . . . 5. *R. halophilus*.

Flowers monoecious. Stems mostly simple, the upper clusters males, often without floral leaves, the lower clusters females, mostly axillary . . 6. *R. bidens*.

TRIBE II. **Acetosella**.—Flowers dioecious. Styles arising from the angles of the ovary. Inner sepals herbaceous; hardly enlarged in fruit. Leaves hastate or sagittate.

Small plant with narrow leaves mostly sagittate. Stipules silvery-shining 7. *R. acetosella*.

1. ***R. crispus*** (crisped), Linn.; Meissn. in DC. Prod. xiv. 44; Benth. Fl. Austr. v. 263. A perennial with a thick rhizome, and erect furrowed stems 2 to 3ft. high, the branches few and short. Radical leaves narrow, usually 6 to 8in. long, much undulate and crisped at the edges, the upper ones smaller, passing gradually into bracts. Flower-clusters numerous, and when in fruit much crowded into a long narrow and dense terminal panicle. Inner segments of the fruiting perianth broadly ovate, entire, 2 to 3 lines long, with a coloured tubercle on the midrib.

Hab.: Southern localities.

Common in Europe and temperate Asia, and now naturalized in many other parts of the globe. The Australian specimens, like others grown in warm and dry climates, have tubercles on all three inner perianth-segments. More northern specimens have them frequently only on one segment of each perianth.—Benth.

***R. conglomeratus*** (referring to the clusters of flowers), Murr.; Meissn. in DC. Prod. xiv. 49; Benth. Fl. Austr. v. 263. An erect perennial of 2 or 3ft. more branched than *R. crispus*. Radical leaves on long petioles, mostly acute, rounded or even cordate at the base, sometimes 8 to 10in. long, the upper ones smaller. Panicle with long rather spreading branches, the clusters of flowers distinct or distant even when in fruit. Fruiting perianth smaller than in *R. crispus*, the inner segments narrow-ovate, entire, with an oblong tubercle on the midrib of each.—*R. acutus*, Sm. and some others.

Hab.: About Brisbane, C. Stuart; and many other southern localities.

Like *R. crispus*, this species is indigenous in Europe and temperate Asia, and is now naturalized in many other parts of the globe.

3. ***R. Brownii*** (after Dr. R. Brown), Campd. Monogr. Rum. 81; Benth. Fl. Austr. v. 263. A perennial with a thick rhizome and erect simple or slightly branched stems of 1 to 2ft. Radical and lower leaves on long petioles, often cordate or hastate, oblong and obtuse, the stem-leaves mostly lanceolate and acute, the floral ones reduced to small bracts or quite deficient. Clusters remote, many-flowered, forming long simple or slightly-branched racemes, the fruiting pedicels slender or thick, 1 to 3 lines long. Inner segments of the fruiting perianth broadly triangular,  $1\frac{1}{2}$  to 2 lines long, bordered on each side by 4 to 6 bristles, much hooked or almost involute at the end, the midrib prominent but without any distinct tubercle.—Meissn. in DC. Prod. xiv. 61; Hook. f. Fl. Tasm. i. 305; *R. Jimbriatus*, R. Br. Prod. 421 not of Poir.

Hab.: Rockhampton, O'Shanesy; almost all over the colony.

On this species may sometimes be found the fungus—*Puccinia acetosæ*.—Schum.

4. **R. \*obtusifolius** (leaves obtuse), *Linn. Meissn. in DC. Prod.* xiv. 53. The Broad-leaved Dock. Stems 2 or 3ft. high, erect, slightly branched, round, furrowed, leafy, rough chiefly in the upper part. Radical leaves often very large, blunt at the apex, cordate at the base, on long stalks, the upper ones narrower and more pointed, on shorter stalks, all of a deep-green colour and veiny, the edges crenate and in some degree crisped. Root black, yellowish within. Flower-clusters on the lower part of the branches of the panicle distant and leafy. Outer perianth-segments narrow, nearly as long as the inner ones; the inner ones oblong, obtuse, veiny, subsequently furnished on the margins with from 2 to 4 unequal teeth-like lobes, one or all of them also bearing on the centre near the base an oval coloured tubercle.

Hab.: Naturalized about the Brisbane River and other southern parts.

5. **R. halophilus** (a maritime plant), *F. v. M. Fragm.* iv. 48; *Benth. Fl. Austr.* v. 265. An erect branching herb of about 1ft., some specimens appearing annual. Leaves linear or lanceolate, acute or obtuse, the lower ones on long petioles sometimes cordate at the base and 2 to 3 or even 4in. long, the upper ones small, but all or nearly all longer than the flowers. Flowers very small and very numerous, in dense axillary clusters crowded on the greater part of the plant. Inner segments of the fruiting perianth sometimes under 1 line long, with long fine points and marginal teeth, sometimes rather longer and broader with shorter and more rigid points and teeth, always with a very prominent ovoid tubercle on the midrib.

Hab.: Gulf of Carpentaria, *F. v. Mueller*; Flinders and Burnett Rivers, *F. v. Mueller*; Darling Downs, *Lau*.

This plant has entirely the aspect of the European *R. maritimus*, *Linn.*, and may be a variety only. The teeth of the fruiting perianth-segments although fine and long are however always much less so than in the northern plant.—*Benth.*

6. **R. bidens** (2-toothed), *R. Br. Prod.* 421; *Benth. Fl. Austr.* v. 265. A perennial with a thick stem, rooting at the joints and creeping in the mud, throwing up numerous erect thick flowering branches of 1 to 2ft. Leaves lanceolate, the lower ones often 8 to 10in. long, rather broad and obtuse, the upper ones narrower and more acute, passing into the small almost linear floral leaves. Flowers densely clustered, unisexual, but the two sexes mixed in the same clusters, the lower ones chiefly females the upper ones chiefly or entirely males. Perianth-segments at the time of flowering almost petaloid and not very unequal. Inner segments of the fruiting perianth variable in size, usually 2 to 3 lines long, very broad, with 1 or 2 rigid teeth on each side near the base, the midrib more or less thickened into a tubercle.—*Meissn. in DC. Prod.* xiv. 73; *Hook. f. Fl. Tasm.* i. 305.

Hab.: Darling Downs.

7. **R. acetosella** (plant sour), *Linn.*; *Meissn. in DC. Prod.* xiv. 63; *Benth. Fl. Austr.* v. 265. A slender plant with a creeping rhizome and erect stems from a few inches to nearly 1ft. high, often turning red. Leaves narrow-lanceolate or linear, some or all hastate or sagittate at the base; stipules usually silvery and very thin. Flowers small, diœcious, in slender terminal panicles, the clusters numerous, few-flowered, without floral leaves. Perianth-segments broad, entire, not very unequal, the inner ones in the fruiting perianth closed over the seed but scarcely enlarged.

A plant probably of European and Asiatic origin, now common in most temperate and subtropical regions of the globe, and Mr. Bentham says evidently introduced into Australia, from which I disagree as it was common in South Australia at a very early date (1840).

## 3. MUHLENBECKIA, Meissn.

(In honor of Dr. Muhlenbeck, a botanist of Alsace).

Flowers mostly diœcious. Perianth of 5 segments, all equal or the outer ones slightly enlarged. Stamens 8 or rarely fewer, filaments short, the anthers oblong in the males, small and imperfect or abortive in the females. Ovary in the females 3-angled, with a very short trifid style and 3 more or less fringed stigmas, small and rudimentary in the males. Nut triangular or nearly globular, enclosed in the persistent membranous or succulent perianth.—Undershrubs shrubs or woody twiners, rarely herbaceous from the base; all at least of the Australian species glabrous. Stipules brown and scarious, loosely sheathing, very soon torn or ragged. Flowers small, green or whitish, in whorl-like clusters, axillary or within small sheathing bracts, in axillary or terminal simple or paniculate interrupted spikes. Radicle usually curved towards the back of the cotyledons (incumbent), rarely here and there towards their edge (accumbent).

The genus extends to New Zealand, extratropical S. America, and along the Andes to Mexico.

Leaves more or less cordate hastate or sagittate, usually broad and above 1 in. long. Stem prostrate or climbing.

Fruit globular, obscurely angled, not rugose, with the perianth succulent. Spikes mostly axillary. Leaves thin, with a long point.

Spikes very slender. Flowers small. . . . . 1. *M. gracillima*.

Fruit ovoid, more or less 3-angled, very rugose. Leaves rather thick. Spikes mostly in a large terminal panicle . . . . . 2. *M. rhyticarya*.

Shrub. Leaves on luxuriant branches linear, on the others very small or none. Clusters mostly in terminal spikes. Fruit prominently 3-angled . . . . . 3. *M. Cunninghamii*.

1. ***M. gracillima*** (very slender), *Meissn. in DC. Prod.* xiv. 145; *Benth. Fl. Austr.* v. 274. A tall herbaceous twiner, much more slender than *M. rhyticarya*. Leaves on long petioles, ovate-cordate or broadly sagittate, acuminate, membranous, the margins usual crisped, 1 to 2 or rarely 3 in. long. Spikes very slender, almost filiform, simple or paniculately branched, the males much longer and more branched than the females, the flower-clusters small and distant. Perianth not above 1 line diameter when fully spread. Stigmas large and copiously fringed. Fruiting perianth globular and succulent, enclosing an opaque obscurely 3-angled nut.—*Polygonum adpressum*, R. Br. *Prod.* 420 (partly).

Hab.: Moreton Bay, *Leichhardt*; Rockhampton, *O'Shanesy*; Dawson and Burnett Rivers, *F. v. Mueller*, to Stanthorpe.

The fungus blight *Uredo Rumicis*, Schum. with *Darlucium filum*, Cast. upon it, is met with on this plant.

2. ***M. rhyticarya*** (nut wrinkled), *F. v. M. Fragm.* v. 92; *Benth. Fl. Austr.* v. 274. Stems climbing, woody at the base. Leaves mostly broadly ovate-cordate, obtuse or shortly acuminate, 1 to 2 in. long, often rather thick and glaucous. Spikes long and interrupted in the upper axils, and forming a large loose terminal panicle. Fruiting perianth almost membranous enclosing an ovoid-triquetrous nut often 2 lines long and deeply rugose. Seed scarcely furrowed.

Hal.: Cape York, *Daemel*; Port Denison, *Fitzalan*; Edgecombe and Rockingham Bays, *Dallachy*, and again near Stanthorpe.

3. ***M. Cunninghamii*** (after A. Cunningham), *F. v. M. Fragm.* v. 91; *Benth. Fl. Austr.* v. 276. Lignum. A shrub, sometimes low and bushy, sometimes attaining 6 to 8 ft. or even taller, with numerous terete sulcate or angular branches, the young and luxuriant ones often with a few linear or linear-lanceolate leaves of 1 to 3 in. contracted into a rather long petiole, but most of the branches rigid or rushlike often clustered and either quite leafless or with a few linear leaves. Stipules deciduous. Flower-clusters solitary or in short spikes at the leafless nodes or in the axils of the small leaves forming long terminal interrupted spikes.

Perianth rather above 1 line long. Style 3-branched, with broad peltate terminal stigmas more like those of a *Polygonum* than of a *Muhlenbeckia*, but the flowers quite diœcious. Nut prominently 3-angled, smooth and shining, enclosed in the ovoid slightly thickened perianth which is enlarged to from  $1\frac{1}{2}$  to 2 lines in length. Seed scarcely furrowed.—*Polygonum Cunninghamii*, Meissn. in Linnæa, xxvi. 364, and in DC. Prod. xiv. 85; *Muhlenbeckia florulenta*, Meissn. in Linnæa, xxvi. 362; *Polygonum junceum*, A. Cunn.; Lindl. in Mitch. Trop. Austr. 85.

Hab.: Rockhampton. *O'Shanesy*; Suttor River, *Bowman*; Bokhara Creek, *Leichhardt*; Curriwillinghamie, *Dalton*; Darling Downs, *Lau*. Common in most inland swamps.

## Order CIV. PODOSTEMONACEÆ.

Flowers 1-sexual, rarely diœcious, usually enclosed in a spathe. Perianth none or membranous, lobed or partite or of a few scales. Stamens definite or not, free or connate, hypogynous or perigynous, filaments flat; anthers 2-lobed. Ovary free, sessile or stalked, smooth or ribbed, 1 to 2-celled; styles 2, 3, or 1, and columnar, stigma 1 capitate, or 2 to 3, simple toothed or lacinate; ovules many, anatropous, axile or parietal. Capsule 1 to 3-celled; septicidal or septifragal, valves 2 to 3. Seeds minute, testa mucilaginous, albumen none. Embryo straight, cotyledons 2, radicle inferior.—Aquatics growing on stones in tropical streams, annual or perennial. Stems branching with leaves or with these confluent into amorphous fronds. Inflorescence various, often of a 1 or many flowered scape, naked or arising from a tubular sheath.—*Hook. Fl. Brit. Ind.*

Baron von Mueller records in Cen. Austr. Pl. that plants of this Order have been met with in Queensland but that the genera and species had not been determined. The authority rests so far as at present known upon specimens collected by Mr. Walter Hill at the Johnstone River in 1873.

## ORDER CV. NEPENTHACEÆ.

Flowers diœcious. Male perianth of 4 rarely 3 sepal-like segments, imbricate in the bud. Stamens 4 to 16, the filaments united in a central column; anthers united in a head, in 1 or 3 rows, 2-celled, the cells opening outwards in longitudinal slits. Female perianth as in the males, or rarely the segments united at the base. Ovary 4- rarely 3-angled, with as many cells as angles, the carpels opposite the perianth-segments; stigma sessile, with as many lobes as ovary-cells, the lobes entire or bifid. Ovules very numerous in each cell, attached to a placenta inserted on the dissepiment, ascending and anatropous. Capsules coriaceous, opening loculicidally in 4 rarely 3 valves. Seeds very numerous, imbricated upwards; testa membranous, produced at each end into a capillary point or tail. Embryo straight, in the axis of a fleshy albumen; cotyledons linear; radicle short, inferior.—Shrubs or undershrubs with herbaceous branches, glabrous or sparingly hairy, replete with spiral vessels, the stems prostrate sarmentose or climbing by means of tendrils terminating the leaves. Leaves alternate, elongated, without stipules, the base on the winged petiole clasping the stem, marked with a few nearly parallel longitudinal veins and numerous transverse veinlets, the midrib usually produced either into a tendril or into a pendulous pitcher provided with an operculum or lid, the margin of the orifice thickened into a peristome, and having usually an external spur on the back. Flowers small, green, in terminal racemes or panicles.

The Order limited to the single genus *Nepenthes*, is spread over Southern Asia and the islands of the Indian and South Pacific Oceans, but most abundant in the Indian Archipelago.

## 1. NEPENTHES, Linn.

(Linnaeus adopted the name from Breyne, who bestowed in 1689 (Prodr. Pl. Rar. ii. 75), fancifully applying Homer's *Nepenthes* to the liquid found in these natural pitchers.—*H. Trimen*, Fl. of Ceylon, Pt. iii. 420.)

Characters and distribution of the Order.

Stems long climbing.

Pitchers inflated below the middle, 3 to 6in. long, green; anterior ribs without any crest; stalk with a curl in the centre . . . . . 1. *N. Kennedyi*.

Stems shortly climbing.

Pitchers inflated near the base, 3 to 6in. long, pinkish; anterior ribs winged, the wings 1 or 2 lines broad, and more or less prominently ciliate-toothed, without any curl in the centre of the stalk . . . 2. *N. Bernaysii*.

Stems elongated scarcely climbing.

Pitchers narrow at the base, then cylindrical to the top, 6 or 7in. long, green with white streaks; anterior ribs prominent at the base but not winged; stalk flexuose without a curl . . . . . 3. *N. albo-lineata*.

Stems not climbing rather slender.

Pitchers slightly enlarged at the base, 3 to 4½in. long, judging from the dried specimen more or less reddish when fresh; anterior ribs prominent but not winged; stalk slender not forming a curl . . . 4. *N. Moorei*.

Stems not climbing rather stout.

Pitchers inflated below the middle, 5 to 7in. long, more or less purple stained; anterior ribs with narrow purple wings; stalk straight . . . 5. *N. Jardinei*.

Pitchers enlarging from the base to a diameter of about 3in. at the top, length about 6in., marked with reddish-purple colour; anterior ribs hard, scarcely winged; stalk straight, somewhat flattened . . . 6. *N. Rowanæ*.

Stems not climbing very short.

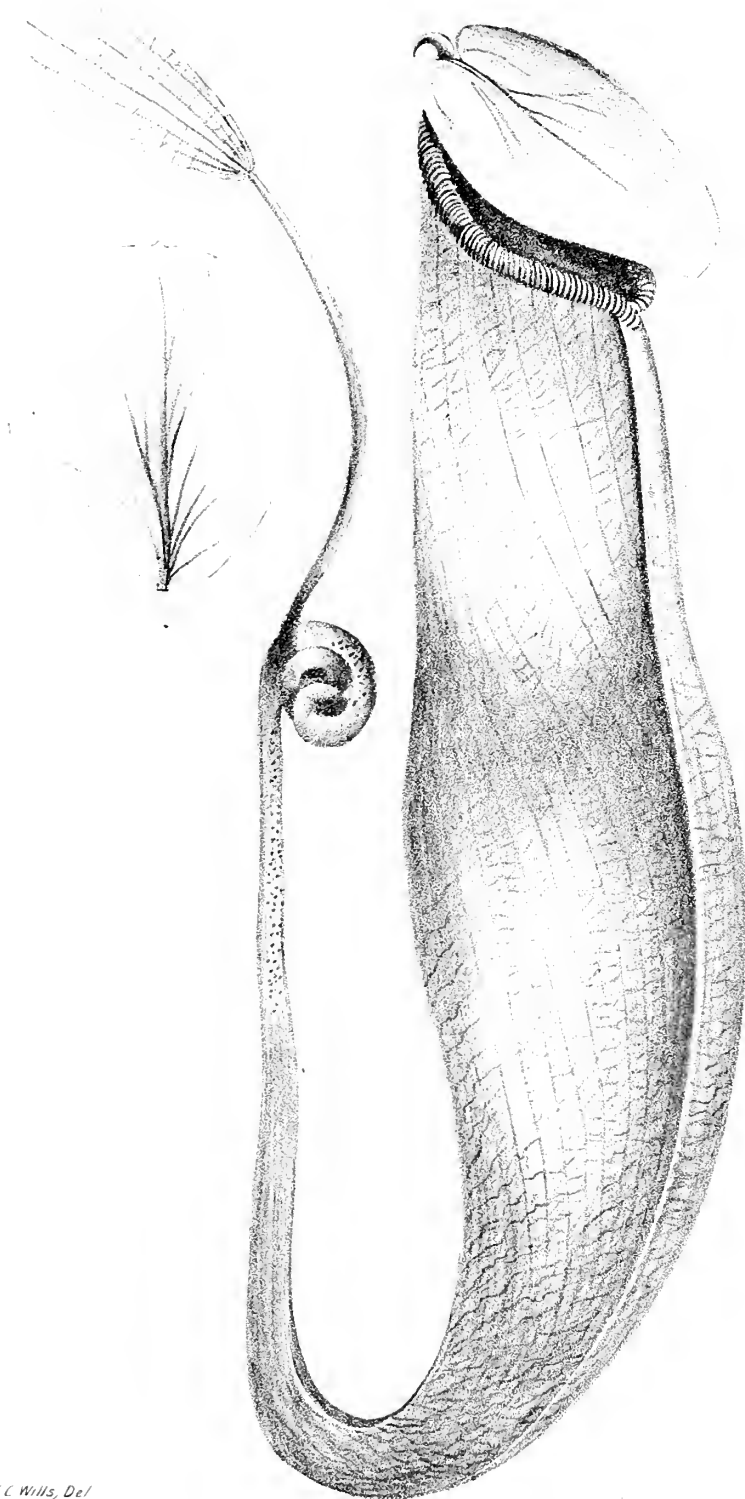
Pitchers numerous, slightly inflated above the base and enlarging again at the top, 1½ to 2½in. long; anterior ribs with entire wings about ¼ line broad; stalk slender, no curl . . . . . 7. *N. Aliceæ*.

Pitchers numerous, 9 to 13 lines long, diameter above the base 2½ to 4 lines, anterior ribs toothed . . . . . 8. *N. Cholmondeleyi*.

1. **N. Kennedyi** (after E. Kennedy), *F. r. M. Fragm.* v. 154; *Benth. Fl. Austr.* vi. 40. Stems climbing, when young pubescent, with stellate hairs. Leaves on long petioles, linear-lanceolate or oblong, then chartaceous, over 1ft. long, and about 2in. broad, longitudinal nerves 5 to 8 on each side of the midrib, the latter elongated and forming a curl midway between the lamina and pitcher. Pitchers 3 to 6in. long, slightly inflated below the middle, without any crest on the anterior ribs, the orifice narrow, posterior spur stout, the peristome narrow, with numerous transverse veins; operculum elliptical, with numerous minute glands on the inner surface, the glandular portion inside pitcher extending two-thirds the way up. Inflorescence; (male) peduncle tomentose, about 3in. long, raceme 6 to 7in. long. Flowers dense. Pedicels about 5 lines long. Perianth-segments 2½ lines long and 2 lines broad. Staminal column 1½ line high, bearing a head of anthers about ½ line in diameter; (female) peduncle about 12in. long, adnate to the shoot for a few inches; raceme 8 to 9in. long. Flowers numerous, scattered. Pedicels about 1in. long. Perianth green, segments 4 to 5, tomentose.—*Bail. Procd. Linn. Soc. of N.S.W. and Ql. Agri. Journal.* iii. 354; Plate in Vol. i. Pt. 5.

Hab.: Cape York, *F. L. Jardine*; Cape Sidmouth, *C. Moore*.

2. **N. Bernaysii** (after L. A. Bernays, C.M.G.), *Bail. Procd. Linn. Soc. of N.S.W., and Ql. Agri. Journ.* i. with plate. Stems climbing, leafy. Leaves shortly petiolate, linear-lanceolate, 12 to 13in. long, 2in. broad, longitudinal nerves 5 on each side of the midrib, sprinkled with black dots and appressed white hairs, midrib produced not curled, freely forming pitchers. Pitchers 3 to 6in. long, inflated at the base, pinkish outside, the 2 anterior ribs winged, 1 to 2 lines broad and ciliate-toothed, the posterior rib ending in a hooked spur. Operculum ovate, with numerous reddish glands on the inner surface, peristome narrow



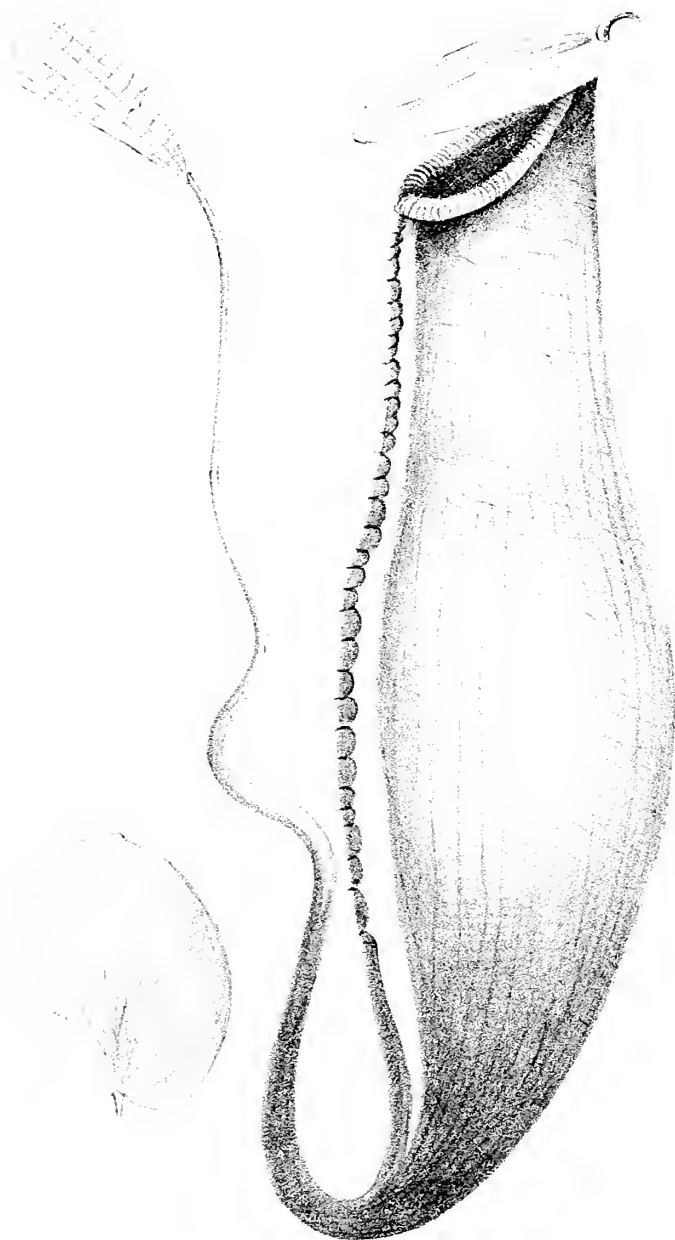
F. C. Wills, Del.

W. L. Mackenzie

*Nepenthes Kennedyana*, FvM  
(Nat. Size)





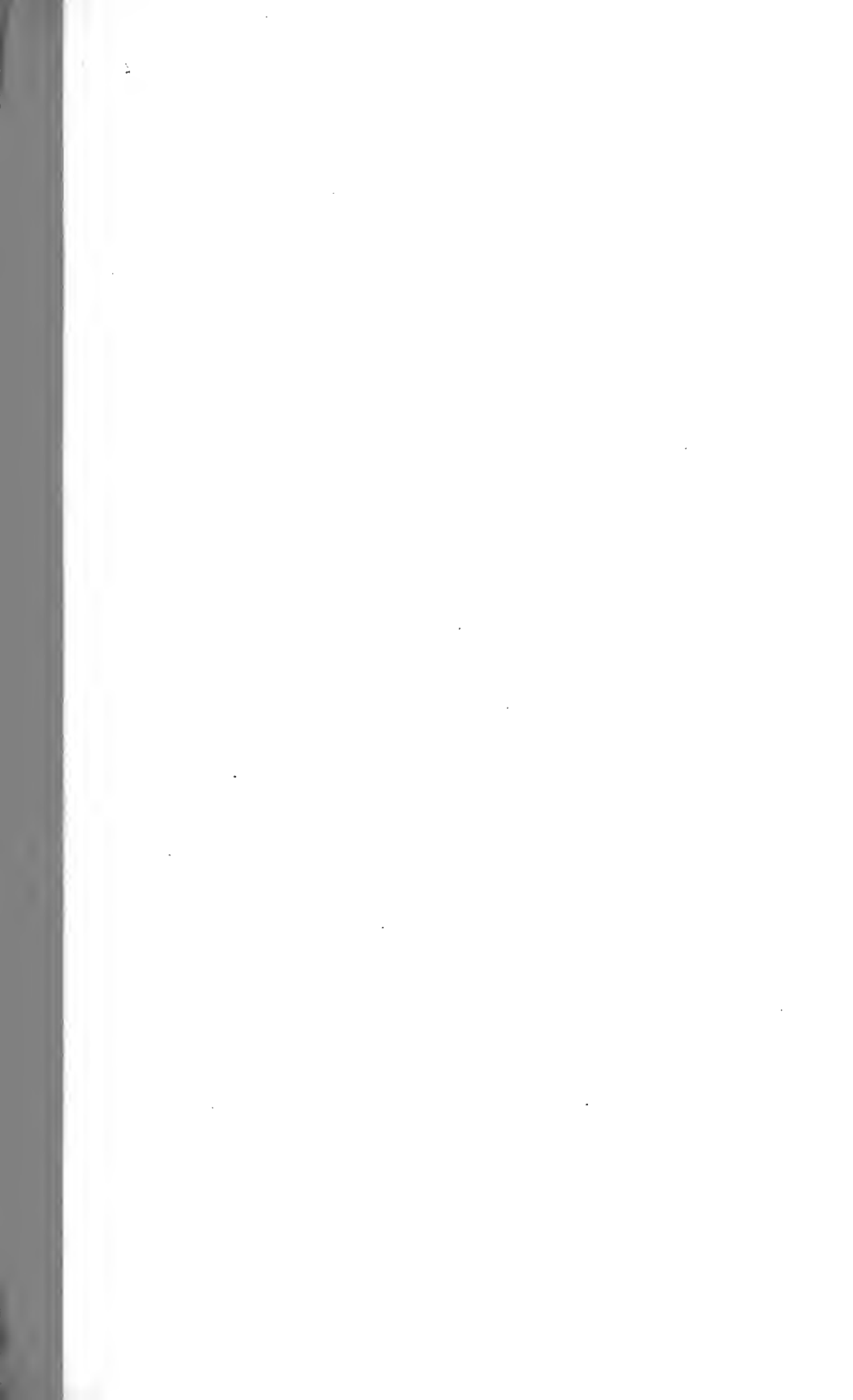


F.C. Wills, Del.

F. Elliott, Lith.

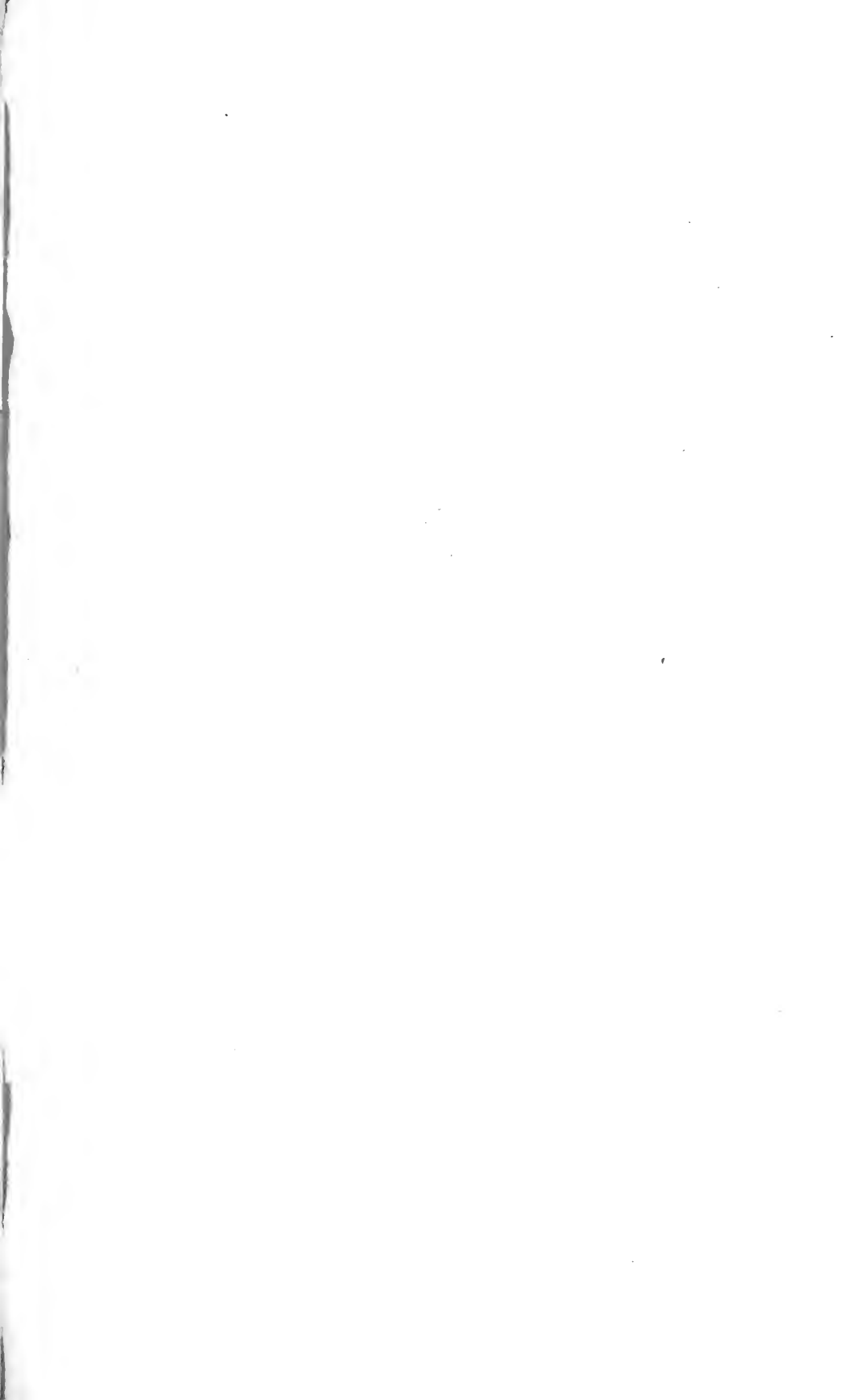
*Nepenthes Bernaysii*, Bail.  
(Nat. Size)

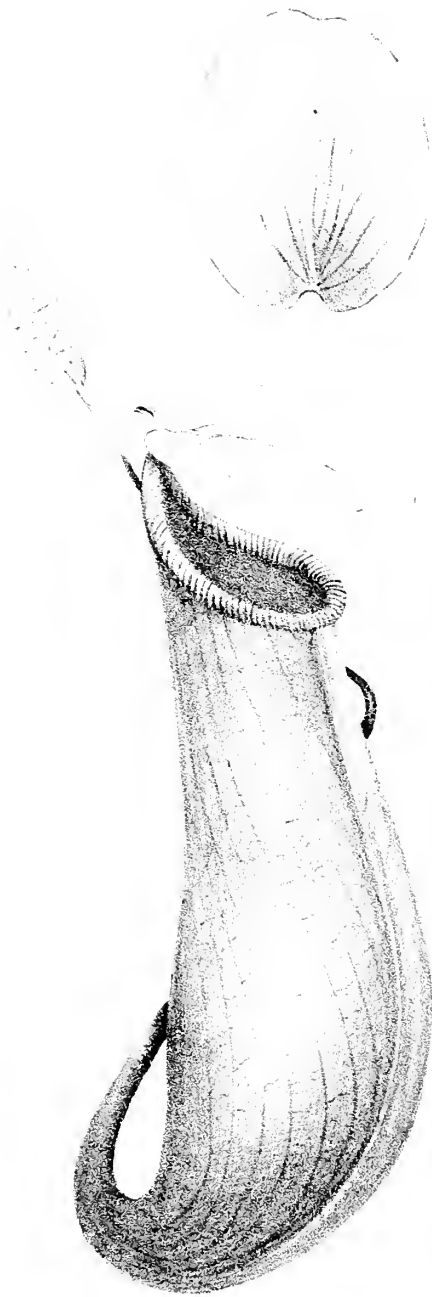






*Nepenthes albo-lineata*, Bail  
(Nat Size)



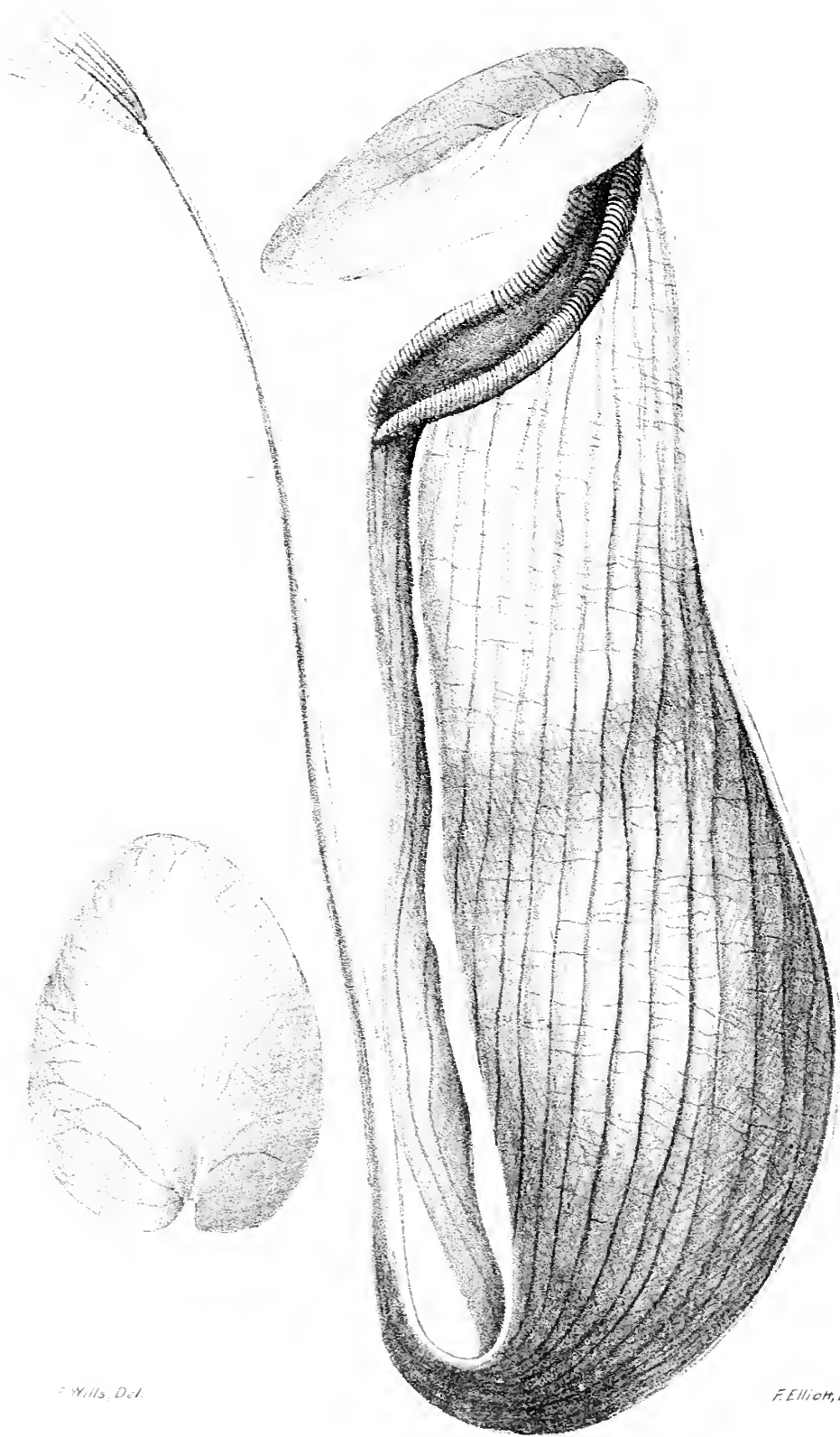


F.C. Wills, Del.

F. Elliott, Lith.

*Nepenthes Moorei*, Bail.  
(Nat. Size)





F. Wills, Del.

F. Elliott, Lith.

*Nepenthes Jardinei*, Bail  
(Nat Size)

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marked with close transverse lines. Glandular portion inside pitcher extending half way up. Peduncles 4 to 6in. long, shortly tomentose, more or less plainly striate. Raceme 5 to 7½in. long, flowers (male) rather crowded. Pedicels slender 5 lines long, tomentose. Perianth with 4 reflexed oblong-cuneate segments, about half as long as the pedicels, glabrous and dark-coloured on the face tomentose on the back. Staminal column about as long as the segments; head of anthers about  $\frac{3}{4}$  line diameter.

Hab.: Cape York, *F. L. Jardine*.

3. **N. albo-lineata** (white-lined), *Bail. Ql. Agri. Journ.* iii, 355, *Pl.* lviii. Plant very slightly tomentose. Leaves shortly clasping the stem; the broad portion or blade 6 to 7in. long and 2in. broad, tapering to the base, or a winged petiole of 2in., and the upper portion to where the costa becomes naked forming the stalk of pitcher, this stalk is flexuous, but without a curl at the centre, about 6in. long. Pitchers (green, slightly streaked with white, *F. L. Jardine*) 6 or 7in. long, enlarging from a narrow base to a diameter of about 1½in., and keeping about this diameter to the top; anterior ribs not winged, but sharply prominent for about one-third of their length from the base, the longitudinal nerves and reticulate veins not prominent. Peristome narrow, posterior spur rather broad, tomentose, much recurved. Operculum elliptical, glossy with the numerous glands of the genus on the inner surface, glandular portion inside pitcher extending halfway up. Male inflorescence terminal or nearly so. Peduncle 5in. long, hoary; raceme about 8in. long. Flowers numerous. Pedicels about 4 lines long, segments of perianth 2½ lines long, linear; column 2½ lines high, bearing a head of anthers  $\frac{3}{4}$  line in diameter. Female flowers unknown.

Hab.: Cape York Peninsula, *F. L. Jardine*. The white streaks mentioned by Mr. Jardine are not observable on the dried pitchers.

4. **N. Moorei** (after C. Moore), *Bail. Ql. Agri. Journ.* iii, 355, *Pl.* lix. Stems attaining a few feet, but not climbing. Leaves nearly glabrous, the expanded portion scarcely exceeding 1in. wide at the broadest part, from which tapering to the base without forming a petiole portion, and tapering upwards to where the costa becomes naked, texture thin, longitudinal nerves 4 or 5 on each side of costa, but not prominent, the naked portion of costa or stalk of pitcher usually slender and without a curl between the acuminate top of the lamina and the base of the pitcher. Pitchers 3 to 4½in. long, 1 to 1½in. broad, glabrous or slightly hoary, slightly enlarged above the base; anterior ribs prominent but not formed into wings; longitudinal nerves numerous and more or less prominent as well as the reticulate veins. Peristome narrow, posterior spur somewhat erect but curved back, resinous. Operculum elliptical, under 1½in. diameter, resinous, glandular on the inner surface, glandular portion inside pitchers extending halfway up. Inflorescence (male) usually from the axils of the upper leaves. Peduncles 4 to 6in. long, racemes 6 to 8in. long, rhachis and back of segments hairy, flowers numerous, but not particularly dense. Pedicel slender, 4 lines long, segments of perianth reflexed upon the pedicel, about 2 lines long and 1 line broad, free to near the base. Staminal column about 2 lines long, bearing a head of anthers about  $\frac{1}{2}$ -line in diameter. So far as the specimens to hand show, the female plants seem to be of smaller growth. Racemes 3 to 4in. long. Perianth segments narrower than in the males. Ovary hoary-tomentose. Capsule 8 lines long.

Hab.: Cape York Peninsula, *F. L. Jardine*. Judging from the dried specimens, the pitchers are probably, when fresh, more or less stained with red.

5. **N. Jardinei** (after Frank L. Jardine), *Bail. Ql. Agri. Journ.* i, with plate. Stems several, rather stout, arising from a hard knotty rhizome, 2 to 3 or more feet high, not climbing, sometimes branched, clothed with leaves mostly bearing

pitchers; the young growth more or less clothed with soft hairs, the shorter ones of which are usually stellate, the longer ones frequently simple. Leaves decurrent and slightly stem-clasping; petiole 2in. long winged; lamina 8in. long and from 2 to nearly 3in. broad in the middle, tapering towards each end; midrib at first purplish-red, longitudinal nerves on each side of midrib usually 6; the narrow portion or stalk of pitcher about 6in., without the loop of *N. Kennedyi*, F. v. M.; pitcher 5 to 7in. long,  $1\frac{3}{4}$ in. diameter near the top, enlarging in the lower half to about  $2\frac{1}{2}$ in., with numerous prominent longitudinal nerves and reticulations; anterior ribs with narrow red wings; orifice wide and arising towards the spur; peristome narrow, about 1 line broad, with numerous transverse veins; posterior spur recurved; operculum elliptical, about 2in. long, with numerous various-sized circular glands on the inner surface; inside of pitcher more or less spotted or stained purplish-red, glandular portion extending rather more than half-way up. Racemes dense, 4 to 8in. long in the males, shorter in the females; male perianth of 4 oval segments, about 3 lines long, reflexed upon the pedicel, united and forming a cup at the base; staminal column about the length of the perianth-segments, head of anthers 1 line diameter. Female perianth like the male, stigma sessile. Capsule coriaceous,  $\frac{3}{4}$ in. long, 4-valved, each valve crowned by a lobe of the stigma.

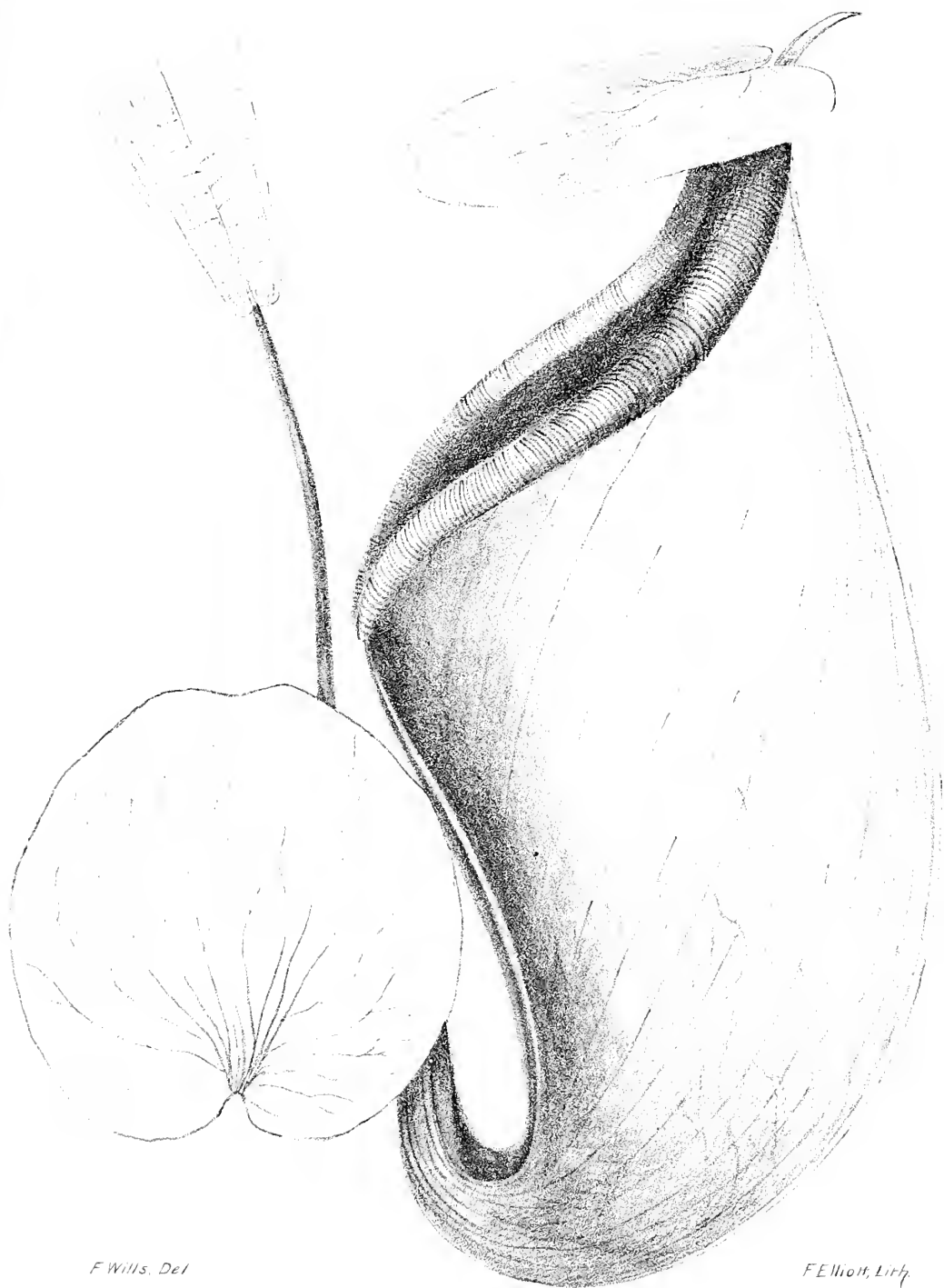
Hab.: Somerset. Cape York Peninsula, *Frank L. Jardine*.

6. **N. Rowanæ** (after Mrs. Rowan, a painter of Australian flowers), *Bail. Ql. Agric. Journ.* i., with plate. Stems stout, erect, 2 or 3ft. high, hoary tomentose. Leaves numerous, coriaceous, prominently decurrent upon the stem, falcately recurved, tapering towards the base into a broad petiole, including this tapering base or broad petiole about 11in. long, the broad centre about  $1\frac{1}{2}$  to  $2\frac{1}{2}$ in. wide; longitudinal nerves 6 on each side of costa, the cross-veins wavy but not very prominent from the thickness of the lamina, the naked portion of costa or stalk of pitcher somewhat flattened, 7 to 10in. long, without a curl, straight and cane-like. Pitchers, when fresh, beautifully marked with reddish-purple, about 6in. long, shortly and abruptly curved at the base, from which it widens upwards, attaining a width at the top of about 3in., prominently marked on the outside by oblique parallel nerves and reticulate veins; anterior ribs hard, scarcely winged, much nearer together than in *N. Jardinei*; orifice very wide, posterior spur flat, tomentose; peristome 3 or 4 lines broad, with close transverse veins; operculum nearly orbicular, about  $2\frac{1}{2}$ in. diameter, with numerous circular glands on the inner surface. Glandular portion inside pitcher nearly reaching the orifice. Flowers and fruit unknown.

Hab.: Cape York, *F. L. Jardine*.

7. **N. Alicæ** (After Miss Alice Jardine), *Bail. Ql. Agric. Journ.* iii. 356, *Pl. lx*. A dwarf plant forming pitchers when only 3 or 4in. high, not exceeding a height of more than a foot (*F. L. Jardine*), starting from a creeping rhizome. Leaves numerous, sessile, and stem-clasping at the base, lamina or broad portion lanceolate, falcate, conduplicate, 2 to  $3\frac{1}{2}$ in. long,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. broad when opened out; parallel nerves 3 or 4 on each side of costa, the naked portion or pitcher stalk slender, about 2 to 3in. long. Pitchers  $1\frac{1}{2}$  to  $2\frac{1}{4}$ in. long,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. diameter, slightly enlarging above the base, and again at the orifice, anterior ribs with entire wings about  $\frac{3}{4}$ -line broad, parallel longitudinal nerves numerous, and as well as the reticulations rather prominent; peristome narrow, posterior spur recurved, often flattened and rather long. Operculum orbicular, 8 lines diameter, purple and glandular on the inner surface and glandular portion inside pitchers, scarcely extending half-way up. Flowers and fruits unknown.

Hab.: Cape York Peninsula, *F. L. Jardine*.



F. Wills, Del

F. Elliott, Lith

*Nepenthes Rowanice*, Baul  
(Nat Size)

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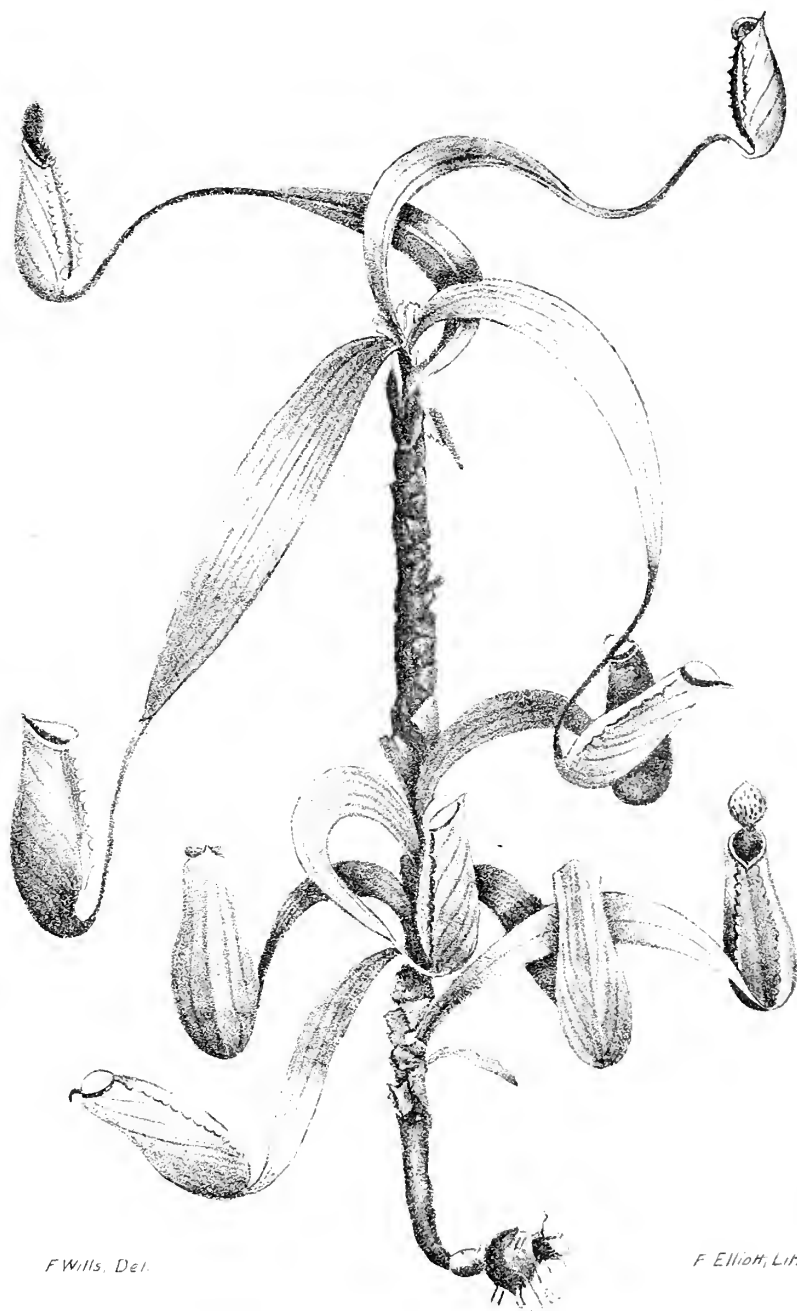


F. Wills Del

*Nipenthes Alcockii*, Brack  
(near Sire)  
Govt. Printing Office, Brisbane







F Wills, Del.

F Elliott, Lith.

*Nepenthes Chalmodeleyi*, Bahl  
(Nat Size)

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8. **N. Cholmondeleyi** (after Cholmondeley Jardine), *Bail. Ql. Agri. Journ.* vii. 441, *Fl. lix.* Judging from the specimens to hand, the stems of this pretty little species are probably numerous from each rhizome, and under 6 in high; the shorter ones with a dense almost rosette of leaves at the top, the taller ones with two such tufts of leaves—one near the base, the other at the summit of the stems. Leaves with scattered hairs, shortly clasping the stem, the broad portion falcate,  $1\frac{1}{4}$  to  $2\frac{1}{2}$  in. long, 2 to 4 lines broad near the middle, longitudinal nerves 4—2 on each side distant from the midrib—, bearing an erect pitcher sessile at the end, or the pitcher removed from 2 or 3 lines to  $1\frac{1}{2}$  in. by the elongation of the midrib, this extension of the midrib seems only to occur in the upper leaves; margins bordered with scattered or close, regular hair-like teeth. Pitchers 9 to 13 lines long; diameter above the base  $2\frac{1}{2}$  to 4 lines, thence slightly contracting to the orifice; anterior ribs with prominently toothed wings, the reticulation well marked; peristome normal; operculum nearly orbicular, glandular on the inner surface; posterior spur recurved, broad at base, point filiform, with 2 prominent weak bristles on either side, glandular portion inside pitchers extending half-way p.

Hab.: Cape York Peninsula, 5 miles south of the Jardine River, *F. L. Jardine*.

## ORDER CVI. ARISTOLOCHIACEÆ.

Flowers hermaphrodite. Perianth herbaceous, adherent to the ovary at the base, with a superior variously shaped entire or lobed limb, the lobes valvate in the bud. Stamens 5, 6, 8 or more, inserted round the base of the style; anthers 2-celled opening outwards. Ovary inferior, 3- to 6-celled, with several ovules in each cell. Styles simple, with an entire or lobed terminal stigma. Fruit a capsule, or rarely succulent. Seeds angular or compressed. Embryo minute, in the apex of a fleshy albumen.—Herbs or rarely shrubs, often climbing. Leaves alternate, without stipules. Flowers usually axillary, solitary or racemose.

A small Order, common to the New and the Old World, chiefly tropical, with a few species dispersed over the temperate regions of the northern hemisphere, and a very few extratropical South American ones. The only Australian genus, the principal one of the Order, has the same general geographical range.—*Benth.*

### 1. ARISTOLOCHIA, Linn.

(From its supposed medicinal qualities.)

Perianth constricted over the ovary, then dilated into an utricle enclosing the stamens and pistils, and produced above the utricle into a limb usually unilabiate, or in a few species not Australian unequally bilabiate or 3-lobed. Stamens adnate to the style; anthers 6 or rarely 5, sessile or on very shortly free filaments. Stigma 3-, 5- or 6-lobed. Capsule usually 6-celled and opening in 6 valves from the base upwards, the pedicel itself also splitting.—Climbers or rarely erect herbs or undershrubs. Flowers axillary, solitary or in clusters or racemes. Perianth very large in some species not Australian.

The genus is widely distributed over the warmer and temperate regions of the globe. Of the five Australian species one is a common South Asiatic one, the other four are endemic.—*Benth.*

Woody climbers, with coriaceous reticulate leaves.

Leaves much acuminate, deeply cordate at the base. Perianth-lip broadly triangular . . . . .

1. *A. deltantha*.

Leaves obtuse or scarcely acuminate, scarcely cordate at the base. Flowers unknown . . . . .

2. *A. pravenosa*.

Small trailing herbs. Leaves membranous. Flowers solitary. Perianth-lip linear-lanceolate.

Leaves 1 to 2 in. long, oblong or ovate, cordate . . . . .

3. *A. pubera*.

Leaves 2 to 5 in. long, linear or linear-lanceolate . . . . .

4. *A. Thozetii*.

Climbing herbs. Leaves membranous. Flowers in axillary racemes or clusters . . . . .

5. *A. indica*.

1. **A. deltantha** (flower-lip triangular), *F. v. M. Fragm.* vi. 179; *Benth. Fl. Austr.* vi. 207. A tall climber, apparently woody, the branches at first pubescent, but becoming glabrous. Leaves shortly petiolate, oblong or oblong-lanceolate, acutely acuminate, deeply cordate at the base, 3 to 5 in. long, coriaceous, smooth and shining above, penniveined, 3 or 5-nerved and very strongly reticulate underneath. Racemes about 2 in. long. Pedicels and very young buds very hirsute. Perianth very dark in coloured stripes, hirsute, the tube about 4 lines long, the utricle very oblique, scarcely stipitate, the upper portion as long as the utricle, curved and dilated upwards, the lamina or lip forming an almost equilateral obtuse-angled triangle, 5 to 7 lines broad. Style hemispherical, with 6 erect stigmatic lobes, without any external transverse ring. Anthers sessile and equidistant. Fruit (only seen in an imperfect state) "yellow, at least 3 in. long and 1 in. diameter, with 6 prominent longitudinal ribs. Seeds and pulp yellow," (*Dallachy*).

Hab.: Rockingham Bay, *Dallachy*; Port Douglas.

2. **A. prævenosa** (much-veined), *F. v. M. Fragm.* ii. 166; *Benth. Fl. Austr.* vi. 208. A tall climbing shrub, the young branches and principal veins of the underside of the leaves ferruginous-pubescent or nearly glabrous. Leaves petiolate, from ovate-oblong and 3 to 4 in. long, to narrow-oblong and 8 to 10 in., obtuse or obtusely acuminate, rounded or slightly cordate at the base, coriaceous, shining above, penniveined and more or less distinctly 3- or 5-nerved, with numerous prominent transverse and reticulate veinlets underneath. Flowers unknown. Fruit of a rich yellow, somewhat succulent, oblong but somewhat narrowed towards the base and apex with a short point, 1½ in. long., diameter 10 lines, 6 ribbed. Seeds compressed, triangular, sides slightly tuberculose-rugose. —Duchartre in *DC. Prod.* xv, i. 496; *Bail. Bot. Bull.* viii.

Hab.: Macpherson Range, *J. F. Shirley*; Nerang Creek, *H. Schneider*. (Specimens from both localities in fruit only.)

3. **A. pubera** (downy), *R. Br. Prod.* 349; *Benth. Fl. Austr.* vi. 208. A small prostrate or trailing herb, with an apparently perennial base, the stems sometimes attaining 1 to 2 ft., sometimes not above 2 or 3 in., more or less pubescent or sometimes quite glabrous. Leaves on rather long petioles, ovate ovate-lanceolate or oblong-pandurate, obtuse, cordate at the base with broad rounded auricles, 1 to 2 in. long. Pedicels axillary, solitary, 1-flowered, 1 to 2 lines long below the ovary, which at the time of flowering is scarcely distinguishable from it, usually bearing a very small bract near the base. Perianth light to darkish-brown, pubescent or glabrous outside the tube, 6 to 7 lines long, shortly constricted below the oblique utricle, slender and cylindrical above it, the lip lanceolate, about as long as the tube. Style broadly hemispherical, with 6 short narrow erect stigmatic lobes, surrounded at the base by a ring of gland-like horizontal lobes, immediately over the sessile anthers. Capsule stipitate, obovoid-globular, about ¾ in. long when perfect, but in some specimens much smaller. Seeds cymbiform, the outer convex surface elegantly tubercular-punctate. —*A. strictiflora*, *Duch.* in *DC. Prod.* xv. i. 484.

Hab.: Brisbane River, *W. Hill*; Rockhampton, *O'Shanesey*; Elliot River and Nercool Creek, *Bowman*; Rockingham Bay, *Dallachy*; in herb *R. Brown* without indication of the station. —*Benth.*

4. **A. Thozetii** (after A. Tozet), *F. v. M. Fragm.* ii. 167; *Benth. Fl. Austr.* vi. 208. A trailing or prostrate herb, closely allied to and perhaps a variety of *A. pubera*, usually rather stouter. Leaves linear or linear-lanceolate, broader at the base and cordate or hastate, usually 2 to 4 in. long; a few of the lower ones

rarely almost ovate-lanceolate. Pedicels solitary in the axils, hairy as well as the perianth tube; lip glabrous, very dark, narrow-linear, about 8 lines long. Fruit of *A. pubera*, and equally variable in size.—Duch. in DC. Prod. xv. i. 484.

Hab.: Rockhampton, *Thozet*, *O'Shanesy*; Keppel Bay, *Thozet*; Herbert's Creek, *Bowman*; Rockingham Bay, *Dallachy*; Barron River, *L. J. Nugent*.

Var. ? *angustissima*. Leaves very narrow and not dilated at the base, pedicels more slender and bracts longer. Flowers only seen very young.—*Benth*.

5. **A. indica** (Indian), *Linn.*: *Duch. in DC. Prod.* xv. i. 479, *Var. ? magna*, *F. v. M. Fragm.* vi. 180; *Benth. Fl. Austr.* vi. 209. A tall but apparently herbaceous glabrous twiner. Leaves in the typical form usually ovate-oblong or almost obovate, obtuse, truncate or cordate at the base, and 2 to 3 in. long; in the Australian variety broader, acutely acuminate, more deeply cordate, 3 to 6 in. long, membranous, 5- or 7-nerved. Flowers in short axillary racemes, sometimes almost contracted into clusters, the pedicels usually longer than the common rhachis, and each with a small bract at the base. Perianth not seen in the Australian variety, in the typical form with a nearly globular utricle of nearly 2 lines diameter, the tube slender and about 3 lines long above the utricle, the lip oblong-linear or narrow-lanceolate, obtuse,  $\frac{3}{4}$  to nearly 1 in. long, slightly dilated and almost 2-auriculate at the base. Capsule ovoid, 1 to 1½ in. long. Seeds flat, obtusely triangular, slightly tuberculate in the centre, with a broad smooth margin.—*R. Br. Prod.* 349.

Hab.: Endeavour River, *Banks and Solander (Herb. R. Brown)*; Rockingham Bay, *Dallachy*; Islands of Torres Strait.

The species is widely distributed over East India and the Archipelago.

## ORDER CVII. PIPERACEÆ.

Flowers hermaphrodite or unisexual, in closely packed spikes or rarely racemes, each with a subtending bract often stipitate. Perianth none. Stamens 2 to 10, inserted on the rhachis or at the base of the ovary. Ovary (except in the tribe *Saurureæ*, which is not Australian) 1-celled, with 1 erect ovule; stigmas 1 to 6, sessile. Fruit a small indehiscent berry. Seed solitary with a farinaceous or fleshy albumen. Embryo minute at the upper end.—Herbs shrubs or climbers, sometimes succulent, often articulate at the nodes. Leaves alternate or rarely opposite or whorled, entire, usually minutely pellucid dotted, with or without stipules. Flowers small, the spikes terminal, leaf-opposed or rarely axillary.

The Order is generally distributed over the tropical and subtropical regions of the New and the Old World, consisting chiefly of the two Australian genera, both of which range over the general area of the Order.—*Benth*.

Anthers of 2 distant cells placed back to back, each opening in 2 valves.

Stigmas 2 to 4, usually 3. Shrubs trees or climbers, rarely tall herbs . . . 1. PIPER.

Anther-cells confluent, the whole anther opening in 2 valves. Stigma tufted.

Herbs often small . . . . . 2. PEPEROMIA.

The spurious dissepiment which so frequently divides the young anther-cell more or less perfectly into two is usually very prominent in Piperaceæ, and the anther is therefore sometimes described as 4-celled in *Piper*, and 2-celled in *Peperomia*.—*Benth*.

### 1. PIPER, Linn.

(From the Bengalese name.)

(Potomorphe and Macropiper, *Miq.*)

Flowers unisexual or hermaphrodite, the subtending bract peltate or adnate. Stamens in the Australian species 2 or 3; anthers of 2 distinct cells placed back to back, each opening outwards in 2 valves. Ovary 1-celled, with a single ovule. Stigmas 3, or in species not Australian 2, 4 or more. Berries sessile or stipitate.—Shrubs trees or woody climbers, rarely tall herbs, the branches

usually articulate at the nodes. Leaves alternate. Spikes usually leaf-opposed and solitary, rarely clustered or solitary on short axillary peduncles or branches.

The genus ranges over all tropical lands, slightly extending to the southward in Australasia and S. America. Of the six Queensland species one has the wide range of the genus; the others are endemic.

Spikes solitary or 2 or more together on axillary peduncles or short branches. Bushy erect shrubs or tall herbs.

Flowers hermaphrodite. Leaves 6 to 12 in. broad . . . . . 1. *P. subpeltatum*.

Spikes all solitary and leaf-opposed. Stems climbing. Spikes unisexual.

Spikes all dense,  $\frac{1}{2}$  to 1 in. long. Bracts peltate. Anthers exserted.

Berries stipitate. Leaves membranous, glabrous. . . . . 2. *P. Novæ-Hollandiæ*.

Male spikes unknown. Females 1 to 3 in. long. Berries stipitate.

Leaves pubescent underneath . . . . . 3. *P. Banksii*.

Male spikes slender, 3 to 5 in. long, the coils of flowers separated by the adnate bracts. Anthers exserted. Females unknown . . . . 4. *P. triandrum*.

Spikes (female) about 2 in. long, 5 lines in diameter. Peduncles about 9 lines long . . . . . 5. *P. Mestoni*.

Spikes (female) 3 to 4 in. long, not stout. Peduncles about  $1\frac{1}{2}$  in. long . . . 6. *P. Rothiana*.

1. ***P. subpeltatum*** (somewhat peltate), Willd.: *Cas. DC. Prod.* xvi. i. 333; *Benth. Fl. Austr.* vi. 204. A large herb or shrub of 3 to 5 ft., glabrous or with a minute pubescence on the petioles and nerves of the leaves and on the inflorescence. Leaves on long petioles, orbicular-cordate or almost reniform, shortly and acutely acuminate, membranous, prominently many-nerved at the base, with 1 or 2 primary veins on each side of the midrib higher up, 6 to 12 in. broad, the petiole shortly sheathing at the base. Spikes usually 2, sometimes 3 to 7 together, shortly pedicellate on a common axillary peduncle of  $\frac{1}{3}$  to 1 in., and often 2 common peduncles in the same axil, the spikes very dense, 1 to 3 in. long. Bracts peltate, the terminal laminae triangular or semilunar, hirsute at the margin. Flowers hermaphrodite. Berries obovate-3-gonous, glandular-pubescent.—*Potomorphe subpeltata*, Miq., *Wight Ic.* t. 1925.

Hab.: In most of the tropical scrubs. Widely spread over the tropical regions of both the New and the Old World.

2. ***P. Novæ-Hollandiæ*** (of New Holland—Australia), *Miq. Pip. Nov. Holl. (from Meddel. K. Akad. Vetensk. Amsterd.* ser. 2, ii.); *Benth. Fl. Austr.* vi. 204. A tall dichotomous plant climbing up trees in dense scrubs. Leaves on the barren branches usually broadly ovate, equally cordate, acuminate, 7-nerved, 3 to 4 in. long; on flowering branches not so broad, unequal at the base, scarcely cordate, and quintupli- or septupli-nerved. Spikes unisexual, leaf-opposed, the males  $\frac{1}{2}$  to nearly 1 in. long, on slender peduncles rather shorter than the spike, very dense, 1 to  $1\frac{1}{2}$  line diameter. Bracts orbicular-peltate, the lamina much undulate when the flowers are fully out. Stamens 2 or 3, shortly exserted. Fruiting spike not longer than the males. Berries ovoid, red, 2 to 3 lines long, on stipules at least twice that length when full-grown.—*Cas. DC. Prod.* xvi. i. 343.

Hab.: Brisbane River and Moreton Bay, *W. Hill*; Rockhampton, *Thozet*; Rockingham Bay, *Dallachy*.

The ethereal spirituous extract of the wood yields crystals, the nature of which has not been ascertained.—*Dr. Joseph Bancroft*.

Wood coarse-grained and pungently scented when newly cut.—*Bailey's Cat. Ql. Woods*, No. 305.

3. ***P. Banksii*** (after Sir Joseph Banks). *Miq. Pip. Nov. Holl.* 9; *Benth. Fl. Austr.* vi. 205. A tall woody climber, the branches and upper surface of the leaves glabrous or nearly so. Leaves ovate, acuminate, oblique and often slightly cordate at the base, membranous, septuplinerved, 3 to 6 in. long, more or less sprinkled or villous underneath with scattered hairs. Spikes

unisexual, the males not seen, the females leaf-opposed, 1 to 3 in. long, on peduncles rarely exceeding  $\frac{1}{2}$  in. Berries red, ovoid or almost globular, 2 to  $2\frac{1}{2}$  lines long, on stipules of about the same length.—Cas. DC. Prod. xvi. i. 342.

Hab.: Endeavour River, *Banks and Solander*; and many other tropical scrubs.

4. **P. triandrum** (3 stamens), *F. v. M. Fragm.* v. 197; *Benth. Fl. Austr.* vi. 205. A bushy climber, quite glabrous. Leaves shortly petiolate, ovate, acuminate, unequal at the base, but scarcely cordate, membranous, quintupli or septupli-nerved, 3 to 5 in. long. Males spikes leaf-opposed, slender; 3 to 5 in. long. Bracts adnate to the rhachis, with a very small free margin separating the coils or rings of flowers. Stamens 3, the anthers slightly protruding. Female spikes very slender, 3 to 7 in. long; peduncles scarcely 1 in. long. Berries roundish-oval, about 2 lines long, never crowded.—Cas. DC. Prod. xvi. i. 365.

Hab.: Mackay, *Dallachy*; and many other tropical scrubs.

5. **P. (Chavica) Mestoni** (after A. Meston). Queensland Long Pepper. A large climber adhering to the stems of trees by adventitious roots. Leaves broadly ovate-acuminate, rounded at the base, and nearly or quite equal-sided, 6 to 8 in. long, 4 to 5 in. broad, on petioles of about  $\frac{3}{4}$  in., septuplinerved. Spikes unisexual, leaf opposed; males not seen; females or fruiting spikes of a brownish colour, formed by the firmly united fruits, nearly 2 in. long and 5 lines diameter at the base, terete, tapering towards the end. Peduncles about  $\frac{3}{4}$  in. long. Styles rather prominent, 2-lipped.

Hab.: Harvey's Creek, Russell River.

This species is nearly allied to *P. Chaba*, Hunter in Hook. Fl. Brit. Ind. v. 83 (the *Chavica pepuloides*, Miq. of Wight Ic. t. 1927).

This and the following species are near allies of the Long Pepper of commerce.

6. **P. (Chavica) Rothiana** (after Dr. W. E. Roth), *Bail. Pl. Agric. Journ.* v. 391. "Chib-bi," Atherton, *J. F. Bailey*. A tall climbing plant adhering to tree trunks by adventitious roots, like Ivy. Leaves ovate-acuminate, 4 to 6 in. long, 2 to  $2\frac{1}{2}$  in. broad, rounded or slightly cordate at the base, usually 5-nerved; petiole stout, about 4 lines long, hairy as well as the lower parts of the nerves. Spikes (only fruiting spikes obtained) nearly horizontal from the branch, 3 to 4 in. long, not very stout, on peduncles of about  $1\frac{1}{2}$  in. The dried fruitlets  $\frac{3}{4}$  line long.

Hab.: Atherton, *J. F. Bailey*.

The aboriginal word above quoted seems a generic name for Pipers.—*J. F. Bailey*.

## 2. PEPEROMIA, Ruiz. and Pav.

(Analogous to *Piper*.)

Flowers hermaphrodite, the subtending bract peltate. Stamens 2; anther-cells confluent at the apex, the whole anther opening in 2 valves. Ovary 1-celled with a single ovule. Stigma tufted or capitate. Berries sessile or scarcely stipitate.—Herbs sometimes very small, rarely tall or shrubby at the base. Leaves alternate opposite or whorled, usually succulent or membranous and pellucid-dotted. Spikes slender, terminal axillary or rarely leaf-opposed. Flowers and berries very small.

The genus is spread over the tropical and subtropical regions of the New and the Old World, but it is especially rich in American species. Of the three Australian species one is also in the Pacific Islands, one extends over nearly the whole area of the genus, the other is endemic.

Leaves usually opposite, pubescent, thin when dry . . . . . 1. *P. leptostachya*,  
Leaves in whorls of four, glabrous or nearly so, coriaceous when dry. . . . 2. *P. reflexa*,  
Leaves opposite or three in a whorl, glabrous . . . . . 3. *P. enervis*.

1. **P. leptostachya** (slender-spiked), *Hook. and Arn. Bot. Beech.* 96; *Benth. Fl. Austr.* vi. 206. Stems shortly decumbent and rooting at the base, ascending or erect from a few inches to about 1ft. long, more or less pubescent with scattered hairs as well as the foliage. Leaves opposite or rarely appearing whorled from the close approximation of two whorls under the branches, ovate-elliptical or obovate, obtuse or obtusely acuminate, under  $\frac{1}{2}$ in. long in rocky exposed situations, above 1in. in shady places, cuneate or rounded at the base, thinly membranous when dry, 5-nerved but the lateral nerves near the margin and sometimes very faint. Spikes very slender, terminal or in the upper axils 2 to 3in. long or even more. Bracts very small, peltate, almost sessile. Berries usually pubescent.—*Cas. DC. Prod.* xvi. i. 448; *Miq. Pip. Nov. Holl.* 6; *P. Baueriana* var. *brisbaniana*, *Cas. DC. l.c.* 414.

*Hab.*: Brisbane River, Moreton Bay, *F. v. Mueller*; Rockhampton, common in the scrubs, *O'Shanesey, Bowman, Dallachy*; Rockingham Bay, *Dallachy*; very common on rocks everywhere.

The species is also in the Pacific Islands, and is very closely allied to an East Indian one.

2. **P. reflexa** (reflexed). *A. Dietr.; Cas. in DC. Prod.* xvi. i. 451; *Benth. Fl. Austr.* vi. 206. A small erect or diffuse herb, said to be annual, 2-3-chotomously branched, more or less succulent and quite glabrous or slightly pubescent. Leaves in whorls of 4, very shortly petiolate or almost sessile, ovate-rhomboidal or almost orbicular, very obtuse,  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long, fleshy when fresh, coriaceous when dry, the veins very obscure. Spikes terminal, dense, shortly pedunculate.  $\frac{1}{2}$  to  $1\frac{1}{2}$ in. long. Bracts almost sessile, peltate. Ovary half-immersed, with a capitate stigma. Berries exserted.—*Miq. Pip. Nov. Holl.* 7; *Wight Ic. t.* 1923.

*Hab.*: Common on the rocks of southern ranges. Common in most tropical countries.

3. **P. enervis** (veinless), *C. DC. et. F. v. M. Vict. Nat. Nov.* 1891. Rather dwarf, sometimes attaining the height of 1ft., erect or diffuse, flaccid, glabrous; the upper branches angular. Leaves 6 to 9 lines long, cuneate-obovate, the lateral veins almost obliterated. Flower spikes solitary, or occasionally 2 together, from 1 to  $1\frac{1}{2}$ in. long, very slender, mostly terminal, pedunculate; flowers close, bracts very minute, orbicular, ovary almost entirely immersed, stigma oblique. Fruit minute, almost globular, when dry slightly rough.

*Hab.*: Bartle Frere, *Stephen Johnson* and *A. Meston*.

## ORDER CVIII. MYRISTICÆ.

(From *myristikos*, smelling of myrrh.)

Flowers dioecious, regular. Perianth deciduous, 3-lobed or rarely 2- or 4-lobed, the lobes valvate in the bud. Male fl. Stamens united in a central column; anthers 3. 6 or more adnate to the column at the apex, or in a ring immediately below the column, each with 2 parallel cells opening longitudinally. Female fl. Ovary free within the perianth, with a single erect anatropous ovule; stigma sessile or nearly so, capitate or depressed. Fruit succulent, opening tardily in 2 valves. Seed erect, sessile, more or less covered with a lobed or jagged often scarlet arillus (or arillodium) proceeding from the base of the seed. Albumen remarkably ruminant. Embryo very small, at the base of the seed, with divaricate cotyledons.—Trees often aromatic. Leaves alternate, entire, usually dotted, penniveined, without stipules. Flowers small, in axillary or supra-axillary racemes or panicles, more numerous in the males than in the females. Bracts minute or none.

The Order is limited to the single genus *Myristica*.

## 1. MYRISTICA, Linn.

Characters those of the Order.

The genus is entirely tropical, most abundant in the Eastern Archipelago, with a few species from Continental India or from the Mascarene and South Pacific Islands, and several from tropical America. The only Australian species may be endemic, but is closely allied to an Indian one.—*Benth.*

1. **M. insipida** (insipid), *R. Br. Prod.* 400; *Benth. Fl. Austr.* v. 281. Native Nutmeg. "Kurroonbah," Barron River, *J. F. Bailey*; "Gooroombah," Tully River, *J. F. Bailey*. A fine tree of 60 to 70ft. or more glabrous, but the young branches and petioles often ferruginous. Leaves oval-elliptical or oblong, shortly acuminate, rounded or cuneate at the base, all under 4in. long in some specimens, all above 6in. in others, and often very variable in size and breadth on the same specimens, pale and shining above with the veins impressed, more or less glaucous underneath, with from 7 to 20 prominent primary veins on each side of the midrib. Male flowers few or rather numerous, in sessile axillary clusters. Pedicels shorter than the perianth, with a small broad ciliolate bract close under the flowers. Perianth cylindrical, 2 to 2½ lines long, with 3 lobes scarcely above ½ line long. Staminal column included, not dilated at the top; anthers 6, linear, adnate in a ring below the top of the column and occupying two-thirds of its length. Female flowers not seen. Fruits solitary or 2 together on very short thick axillary pedicels, ovoid or ovoid-oblong, about 1in. long, rusty-tomentose or nearly glabrous. Seeds normal; embryo with very small thick divaricate cotyledons quite entire.—*A. DC. Prod.* xiv. 206; *A. cimicifera*, *R. Br. Prod.* 400; *A. DC. l.c.* 191.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks and Solander*; Albany Island, *W. Hill*; Rockingham Bay, *Dallachy*; near Rockhampton, *Thozet*.

Wood of a pinkish-grey colour, tough and easily worked.—*Bailey's Cat. Ql. Woods*, No. 306.

## ORDER CIX. MONIMIACEÆ.

Perianth regular, usually at first globular or nearly so or more and less adnate to or continuous with the expanded receptacle or staminal disk, the limb of 4 or more connivent lobes or segments in 2 or rarely more rows but all of similar texture, calycine or scarcely petaloid, deciduous or persistent. Stamens either definite and opposite the perianth-segments or more frequently indefinite and irregularly arranged in several rows; filaments very short; anthers adnate, usually extrorse, the cells opening in separate valves or in longitudinal slits, either distinct or confluent at the apex. Gynæcium of several carpels, free and distinct, rarely reduced to a single one, each with a single ascending or pendulous anatropous ovule. Style terminal, usually oblique excentric or almost lateral, filiform or very short or almost none, with a small or pulvinate terminal stigma. Fruit of several (or rarely only one) 1-seeded drupes or nuts, resting on the expanded receptacle or persistent portion of the perianth tube or enclosed in the enlarged perianth. Seed with a membranous testa and fleshy albumen. Embryo usually very small, with divaricate or appressed cotyledons and a short or long radicle next the hilum.—Trees shrubs or woody climbers, usually glandular-dotted and aromatic. Leaves opposite entire or toothed, without stipules. Flowers solitary or in trichotomous cymes of definite raceme-like or thyrsoïd panicles, axillary or rarely terminal. Bracts usually very small.

The Order is chiefly South American, tropical with a few extratropical species, and is also represented in the Mascarene Islands and more sparingly in tropical Asia, New Zealand, and the islands of the South Pacific.

TRIBE I. **Monimieæ**.—*Anther-cells opening longitudinally, with 2 distinct cells or the cells confluent at the apex. Ovules pendulous. Perianth 4-lobed. Flowers unisexual or polygamous.*

Carpels numerous. Fruiting perianth enlarged, irregularly globose com-

pletely enclosing the carpels. Stems climbing. . . . . 1. PALMERIA.

Stamens indefinite, few or numerous, irregularly lining the perianth-tube.

Flowers usually diœcious . . . . . 2. MOLLINEDIA.

Stamens 4, opposite the perianth-lobes, with frequently 1 to 3 smaller ones within. Flowers usually monœcious . . . . . 3. KIBARA.

Fruiting perianth circumsciss or expanding under the carpels and scarcely enlarged. Carpels numerous . . . . . 4. HEDYCARIA.

Flowers polygamous. Perianth-segments or scales about 6. Stamens numerous, filaments filiform. Carpels solitary. Stems climbing . . . . . 5. PIPTOCALYX.

TRIBE II. **Atherospermeæ**.—*Anther-cells distinct, opening each in a separate valve from the base upwards. Ovule erect or rarely pendulous.*

Flowers unisexual. Anther-connective not produced . . . . . 6. ATHEROSPERMA.

Flowers hermaphrodite. Anther-connective with a long subulate appendage . . . . . 7. DORYPHORA.

Flowers hermaphrodite, small, in thrysoid panicles. Anther-connective not produced . . . . . 8. DAPHNANDRA.

### 1. PALMERIA, F. v. M.

(After J. Palmer.)

Flowers diœcious. Male perianth hemispherical, with 4 or 5 connivent lobes. Stamens numerous, without staminodia or rudimentary carpels; anthers sessile or nearly so; the cells distinct, opening longitudinally. Female perianth nearly globular, with a minute orifice, staminodia none. Carpels numerous, with 1 pendulous ovule in each; styles filiform slightly protruding through the orifice of the perianth. Fruiting perianth enlarged, irregularly globular or pear-shaped, completely enclosing the drupes. Seed pendulous.—Woody climbers (or trees?). Leaves entire. Flowers small, in axillary raceme-like cymes or panicles. Bracts none.

The genus is endemic in Australia.

1. **P. scandens** (climbing), *F. v. M. Fragm.* iv. 152, v. 2; *Benth. Fl. Austr.* v. 291. A tall woody climber, the branches minutely tomentose or woolly pubescent. Leaves shortly petiolate, ovate or broadly elliptical, acuminate, 3 to 5 in. long, hoary tomentose on both sides or at length glabrous above. Male inflorescences somewhat branched and half as long as the leaves, female shorter and more simple. Male perianth about 2 lines diameter, flat on the top, the lobes connivent and produced into long points inflexed over the stamens into the centre of the disk before the flower expands. Stamens 16 to 20, surrounding in several rows a small hairy disk; anthers oblong, slightly hairy, not longer than the perianth. Female perianth about 1½ line diameter, densely villous inside. Carpels 10 or more, glabrous, tapering into the style. Fruiting perianth irregularly shaped, more or less fleshy, about ½ in. diameter. Drupes glabrous, with a thin exocarp and hard bony endocarp. Seed with a membranous testa, pendulous from near the apex of the cavity, with a rather long hilum, the inside dried up and the embryo undeveloped in all the drupes opened.—*A. DC. Prod.* xvi. ii. 657.

Hab.: Rockingham Bay, *Dallachy*; Wild River, *J. F. Bailey*.

### 2. MOLLINEDIA, Ruiz. and Pav.

Flowers unisexual, usually diœcious. Perianth ovoid globular or turbinate, nearly closed by 4 connivent lobes or rarely, in species not Australian, more deeply divided and spreading. Stamens in the males indefinite, few or many, irregularly lining the inside of the perianth-tube; anthers sessile or nearly so, the cells confluent at the apex and opening longitudinally round the apex and to the base on each side, without staminodia or abortive carpels. Female perianth circumsciss after flowering; staminodia none. Carpels usually numerous, covering the receptacle in many rows, with one pendulous ovule in each; style very short and obtuse or the stigma sessile. Fruiting carpels several, ovoid,



drupaceous, sessile or stipitate on the expanded receptacle. Seed with a fleshy albumen; embryo small, with small erect cotyledons, the radicle superior.—Trees or shrubs. Leaves entire or toothed. Flowers small, in axillary lateral or almost terminal cymes or thyrsoid panicles. Bracts very small.

The genus is rather numerous in tropical America, but unknown elsewhere besides the Australian species, which are endemic.—*Benth.*

- |                                                                                                                                                                         |                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Leaves coriaceous, much reticulate underneath, the petioles short. Young parts often pubescent. Ovary and young fruits villous . . . . .                                | 1. <i>M. Huegeliana</i> .   |
| Leaves prominently veined, narrow-lanceolate, margins more or less toothed. Peduncles slender, single or forked; flowers few. Receptacle and carpels glabrous . . . . . | 2. <i>M. angustifolia</i> . |
| Leaves membranous or chartaceous, obtuse, the veins scarcely prominent. Petioles rather long. Flowers and fruit glabrous . . . . .                                      | 3. <i>M. Wardellii</i> .    |
| Leaves smooth lanceolate, margins entire. Receptacle hairy . . . . .                                                                                                    | 4. <i>M. maccoorata</i> .   |
| Leaves nearly of <i>M. Wardellii</i> . Carpels of the fruit obtusely and obliquely acuminate . . . . .                                                                  | 5. <i>M. lorocarya</i> .    |
| Leaves nearly of <i>M. Wardellii</i> , but acutely acuminate. Stamens crowded on the disk . . . . .                                                                     | 6. <i>M. acuminata</i> .    |
| Leaves sometimes nearly in whorls of three, broad-lanceolate. Carpels hairy . . . . .                                                                                   | 7. <i>M. subternata</i> .   |

1. **H. Huegeliana** (after Baron C. von Huegel), *Tul. in Ann. Sc. Nat. Sér. viii.* 399; and in *Archiv. Mus. Par.* viii. 399; *Benth. Fl. Austr.* v. 286. A small tree, the young shoots inflorescence and underside of the leaves usually pubescent. Leaves on short petioles, ovate-elliptical to oblong-lanceolate, obtuse or shortly acuminate, entire or bordered by short rigid teeth, rounded or rarely acute at the base, mostly 3 to 4 in. long, but varying to short and broad or long and narrow, more coriaceous and shining above than other species, strongly reticulate. Flowers apparently diœcious, in little cymes or thyrsoid panicles very short and sessile or nearly so, in the axils, pedicels rather long in the males with a very short common peduncle, the pedicels shorter in the females with a longer peduncle or rhachis, almost forming a few-flowered raceme of about an inch. Male perianth glabrous, nearly globular, about 1 line diameter, the small orifice almost closed by 4 minute broad lobes, 2 inside the 2 others and 1 or 2 outer lobes (or adnate bracts?) opposite the inner ones. Stamens 8 to 14, irregularly lining the perianth as in American *Mollinediæ*. Female perianth larger, very villous inside, circumsciss after flowering. Carpels numerous and villous. Drupes sessile on the base of the perianth or disk, expanded to a diameter of 3 or 4 lines, ovoid-globose,  $\frac{1}{2}$  in. long, pubescent or at length glabrous.—*Wilkiea Huegeliana*, A. DC. *Prod.* xvi. ii. 669.

Hab.: Brisbane River, Moreton Bay, A. Cunningham, Fraser, F. v. Mueller; the most common species.

Wood light-coloured, close-grained, hard and tough.—*Bailey's Cat. Ql. Woods*, No. 306a.

2. **M. angustifolia** (leaves narrow), *Bail. Bot. Bull.* v. 23. A tall shrub or small tree, quite glabrous. Leaves prominently veined, like those of *M. Huegeliana*, narrow-lanceolate attaining the length of 5 in., and at the widest part not over  $1\frac{1}{4}$  in., attenuated towards each end; apex very blunt; margins undulate and more or less toothed; petiole very short. Peduncles axillary, about  $\frac{1}{2}$  in. long, quite slender, bearing a single or, when forked, 2 or more flowers. Receptacle and carpels glabrous.

Hab.: Bellenden-Ker, at about 3,000 or 4,000 ft. elevation. I would not venture to name from such imperfect material were it not in the hope that a short notice may enable persons visiting the locality to identify the plants and collect those portions wanting to complete the diagnosis.

3. **M. Wardellii** (after W. Wardell), *F. v. M. Fragm.* v. 155; *Benth. Fl. Austr.* v. 287. A glabrous shrub. Leaves ovate elliptical or obovate-oblong, obtuse, obscurely crenulate, contracted into a rather long petiole, mostly about

2in. long, but varying from  $1\frac{1}{2}$  to 3in., of a much thinner consistence than in *M. Huegeliana*, and the primary veins scarcely conspicuous. Panicles thyrsoïd, loose, often as long as the leaves. Pedicels 2 to 3 lines long. Male perianth obovoid, globular,  $1\frac{1}{2}$  line diameter, with 4 short broad connivent lobes. Stamens 15 to 20, irregularly lining the perianth as in the American *Mollinedia*. Fruiting perianth circumscribed, the carpels or drupes ovoid-globular, obtuse, glabrous, 4 to 5 lines long, very shortly stipitate on the flat expanded perianth-base or disk.—*Wardellia paniculata*, F. v. M. Fragm. vi. 252.

Hab.: Rockingham Bay, *Dallachy*.

4. ***M. macooria*** (aboriginal name of South Peak of Bellenden-Ker), *Bail. Bot. Bull.* v. 23. A tall shrub or small tree, quite glabrous except the inflorescence; leaves coriaceous, smooth, lanceolate, on very short thick petioles, 2 or 3in. long by  $1\frac{1}{4}$ in. wide in the middle; margins quite entire, the apex more or less elongated; lateral veins numerous and almost parallel. Peduncles terminal or becoming lateral from the growth of the shoot, enlarged under the receptacle, but sometimes a common very short peduncle bearing two branches, but usually single. Receptacle hairy, carpels 4 to 12,  $\frac{1}{2}$ in. or more long, oblong, nearly or quite sessile.

Hab.: Bellenden-Ker Range up to the summit of the South Peak, 5,000ft.

This plant somewhat resembles *M. Wardellii*; but differs too much in fruit and foliage to allow of its being placed under that species.

5. ***M. loxocarya*** (oblique fruit), *Benth. Fl. Austr.* v. 287. A glabrous shrub, apparently very nearly allied to *M. Wardellii*, the branches often compressed under the leaves as in *Kibara macrophylla*. Leaves elliptical-oblong, contracted into a rather long petiole as in *M. Wardellii* and of the same consistence, obtuse or shortly acuminate, quite entire, 3 to 4in. long. Flowers not seen. Fruiting panicles  $1\frac{1}{2}$  to 2in. long, resembling those of *M. Wardellii*, but with a pair of small leaves under the first pair of peduncles and the carpels or drupes closely sessile ovoid and shortly obliquely and obtusely acuminate.

Hab.: Rockingham Bay, and other tropical scrubs.

Wood yellowish, close-grained, ad prettily marked.—*Bailey's Cat. Ql. Woods*, No. 307.

6. ***M. acuminata*** (leaves pointed), *F. v. M. Fragm.* v. 155; *Benth. Fl. Austr.* v. 257. A small tree, quite glabrous or the inflorescence slightly pubescent. Leaves ovate-lanceolate or elliptical, acutely acuminate, contracted into a rather long petiole, entire or obscurely and irregularly denticulate, 2 to 3in. long, rather thinner even than in the last two species but not seen in an old state. Panicles thyrsoïd, shorter than the leaves, axillary or terminal. Flowers small. Male perianth glabrous, depressed-globular, about  $1\frac{1}{2}$  line diameter, with 2 short broad bracteoles sometimes adnate at the base; lobes 8 in 2 rows, the 4 outer ones orbicular and much imbricate, the 4 inner narrower and almost valvate. Anthers rather numerous, nearly sessile, occupying the whole disk or with a few abortive hairy carpels in the centre; the outer ones with 2 parallel dorsal cells opening longitudinally as in *Hedycarya*, the inner ones with the cells confluent at the apex as in *Mollinedia*. Female flowers and fruits unknown.

Hab.: Rockingham Bay, *Dallachy*.

This plant, with the habit and general aspect nearly of *M. Wardellii*, is evidently not a congener, the perianth and androecium being much nearer to, although certainly not identical with, those of *Hedycarya*. In the absence, however, of female flowers and fruits its real genus cannot be determined, and I have therefore refrained from giving it a new name to be rejected hereafter as another superfluous synonym.—*Benth.*

7. **M. subternata** (leaves often appearing as in whorls of three), *Bail. Bot. Bull.* v. 22; "Wonda," Tully River, *Roth.* A tall shrub or small tree, with long dependent branches, which, with the petioles, midrib, and primary nerves, are clothed by a greyish tomentum. Leaves in whorls of 3, 1 of which is often placed very slightly lower than the other 2, broad-lanceolate,  $3\frac{1}{2}$  to  $5\frac{1}{2}$  in. long,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. broad, tapering or slightly rounded at the base, elongated to a sharp apex, which is usually furnished with a bristle-like point, glabrous except for the hairs upon the nerves and veins; petiole slender, about  $\frac{1}{2}$  in. long. Peduncles axillary, slender, about  $1\frac{1}{4}$  in. long, bearing 2 spreading branches at the top, each bearing 1 or more pedicellate flowers; receptacle hairy. Carpels 7 or less, shortly stipitate, roundly oval, about 4 lines long, hairy, but becoming nearly glabrous when ripe. Flowers not yet obtained.

Hab.: Freshwater Creek, near Cairns, *E. Cowley*; Tully River, *Roth.*

Wood used for fire-sticks, *Roth.*

Wood of a brown colour, nicely marked, soft and light, useful for cabinet work.—*Bailey's Cat. Ql. Woods*, No. 306b.

### 3. KIBARA, Endl.

(*Brongniartia*, *Blume*; *Sciadicarpus*, *Hassk*; *Sarcostigma*, *Griff*; *Wilkiea*, *N. v. Mueller*.)

Flowers unisexual, usually monœcious. Perianth ovoid-globular or hemispherical, nearly closed by 4 short connivent lobes or teeth, usually (but not in all species) inflexed, or thickened inside in the females. Male fl. Stamens 4 opposite the perianth-lobes, the filaments flattened and more or less adnate to the tube, and above their union either distinct or united in a cup or ring, always shorter than the perianth, and usually 1, 2, or 3 shorter stamens within the four; anther-cells confluent in a single terminal cell opening longitudinally. No rudimentary carpels. Female perianth circumsciss. Staminodia none (unless the thickened interior of the perianth lobes be regarded as such). Carpels several, often numerous, with 1 pendulous ovule in each. Style short and obtuse. Fruiting carpels several, ovoid, drupaceous, sessile or stipitate on the expanded receptacle. Seed with a fleshy albumen; embryo small, with small erect cotyledons, the radicle superior.—Trees or shrubs. Leaves entire or acutely toothed. Flowers small, in axillary cymes or panicles. Bracts very small.

The Australian species are endemic, the genus comprises 1 or perhaps 3 or 4 from the Malayan Peninsula and the Indian Archipelago. The fruits of *Mollinedia*, *Kibara*, and *Hedyccarya* supply no generic distinctive characters.—*Benth.*

Flowers and the whole plant glabrous.

Leaves narrow, rigidly coriaceous. Petioles short. Inflorescence very short. Pedicels 2 to 3 lines long	1. <i>K. macrophylla</i> .
Leaves broad, thinly coriaceous. Inflorescence loose. Pedicels 1 in. long or more	2. <i>K. longipes</i> .
Inflorescence and often the foliage pubescent.	
Panicles loose. Carpels stipitate	3. <i>K. laxiflora</i> .
Panicles short. Carpels sessile	4. <i>K. pubescens</i> .

1. **K. macrophylla** (leaves long), *Benth. Fl. Austr.* v. 288. A tree of considerable size, perfectly glabrous in all its parts. Leaves on very short petioles, oblong or oblong-lanceolate, shortly acuminate, bordered by short pungent-pointed teeth or almost or quite entire, cuneate rounded or cordate at the base, rigidly coriaceous, shining and reticulate. Inflorescence simple or branched, axillary, very short, rarely above  $\frac{3}{4}$  in. long. Pedicels slender, 2 to 3 lines long, with a small bract close under the flower. Perianth globular, quite glabrous, about 1 line diameter, the females with a minute orifice very minutely 4-toothed with thick reflexed fleshy glands (points of the lobes? or staminodia?) inside, the males rather less closed and not thickened. Stamens in the males 4 opposite the lobes, shortly free, with very shortly broad filaments, and 1 or

2 smaller ones inside. Carpels in the females 12 to 15, perfectly glabrous, with broad thick flat sessile stigmas. Drupes closely sessile, ovoid, smooth and glabrous, about  $\frac{1}{2}$  in. long.—*Hedycarya macrophylla*, A. Cunn. in Ann. Nat. Hist. Sér. 1, i. 215; *Mollinedia macrophylla*, Tul. in Ann. Sc. Nat. Sér. iii. 45. and in Archiv. Mus. Par. viii. 401; *Wilkiea calyptrocalyx*, F. v. M. in Trans. Phil. Inst. Vict. ii. 64 and Fragm. v. 3 (partly); *W. macrophylla*, A. DC. Prod. xvi. ii. 669.

Hab.: Endeavour River, *A. Cunningham*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others; Rockhampton, *Dallachy*, *Thozet*, *O'Shanesy*.

Wood light-coloured, close-grained, and nicely marked.—*Bailey's Cat. Ql. Woods*, No. 307A.

2. **K. longipes** (pedicels long), *Benth. Fl. Austr.* v. 289. A tree of considerable size, perfectly glabrous in all its parts. Leaves elliptical oblong or ovate, shortly acuminate, entire or with a few irregular teeth, acute at the base, 4 to 8 in. long, smooth and somewhat shining but much thinner than in *K. macrophylla*. Peduncles slender, axillary or supra-axillary, divaricately branched, forming loose panicles often half as long as the leaves and very broad. Pedicels often 1 in. long, slightly thickened upwards. Bracteoles 1 or 2, minute, close under the perianth. Flowers monœcious, the males and females in the same same panicle, and the latter much the more numerous. Perianths nearly globular, 1 to  $1\frac{1}{2}$  line diameter, the males with 4 connivent lobes, the 2 outer broader than the 2 inner, and not thickened insids; females with a small orifice closed by 4 small lobes, 2 outer and 2 inner, each with a thick reflexed gland-like scale inside. Stamens 4, more or less connate, with 1 or 2 small ones inside. Carpels in the females 11 to 13, oblong, conical, pubescent, with small glabrous stigmatic tips. Perianth circumscess after flowering. Drupes ovoid, about  $\frac{1}{2}$  in. long, glabrous or smooth, very shortly stipitate on the expanded disk or base of the perianth.

Hab.: Tropical scrubs.

Very closely allied to, but perhaps really distinct from the Malayan *K. coriacea*.

Wood straw-coloured, close in grain, hard and nicely marked.—*Bailey's Cat. Ql. Woods*, No. 308.

3. **K. laxiflora** (loose panicles of flowers), *Benth. Fl. Austr.* v. 289. A small tree, the young branches and foliage more or less pubescent. Leaves elliptical or oblong, acuminate or obtuse, rounded or acute at the base, entire or slightly toothed, 2 to 4 in. long. Panicles axillary or from leafless nodes, trichotomous and loose, but usually shorter than the leaves, the males more branched and with more flowers than the females, but sometimes both sexes in the same panicle. Pedicels 2 to 4 lines long, bearing often a small bract at some distance from the flower. Male perianth depressed-globular, 1 to  $1\frac{1}{2}$  line diameter, the orifice almost closed by 4 small lobes. Stamens 4, united in a broad fleshy cup or tube, pubescent inside, and so far as observed without any additional inner stamens. Female perianth similar to the male, but twice the size, with a more minute orifice, and circumscess after flowering, neither male nor female with any inflexed point or scale within the lobes. Carpels above 30, hispid, with short glabrous stigmatic styles, connivent and almost coherent at the tips. Drupes nearly globular or shortly ovoid, nearly  $\frac{1}{2}$  in. long, distinctly stipitate on the expanded disk or base of the perianth.

Hab.: Rockingham Bay and other tropical scrubs.

4. **K. pubescens** (pubescent), *Benth. Fl. Austr.* v. 290. A tree, the branches inflorescence and young foliage more or less pubescent, the older leaves often glabrous or nearly so. Leaves from broadly ovate-elliptical to oblong-lanceolate, obtuse or shortly and obtusely acuminate, shortly and rigidly toothed or nearly entire, rounded at the base, becoming at length coriaceous with the

veins prominent underneath, 2 to 4 in. long, on petioles of  $\frac{1}{4}$  to  $\frac{1}{2}$  in. Flowers in small cymes or clusters sometimes lengthened into short thyrsoid panicles, which are sessile or pedunculate, but usually scarcely  $\frac{1}{4}$  so long as the leaves. Pedicels 2 to 3 lines long. Bracts adnate to the perianth. Perianth about 1 line diameter, nearly globular, the orifice closed with 4 small lobes, thin in the males, thickened inside in the females. Stamens 4 opposite to the perianth lobes, the filaments shortly free and distinct, with 1 or 2 smaller stamens within them. Female perianth circumsciss. Carpels numerous, villous, with thick glabrous nearly sessile stigma. Drupes closely sessile on the dilated disk or base of the perianth, ovoid, glabrous or nearly so, 3 to 4 lines long.

Hab.: Rockingham Bay, *Dallachy*, and southern localities (with the flowers chiefly males).

Wood of a light-brown colour, very prettily marked, resembling English Oak; soft, suitable for cabinet-work.—*Bailey's Cat. Qt. Woods*, No. 307b.

#### 4. HEDYCARYA, Forst.

(Fruit of one species sweet).

Flowers dicæious. Perianth hemispherical or flat, with about 8 (7 to 10) small inflexed lobes. Stamens in the males numerous, covering the whole disk or leaving a small villous centre, without rudimentary carpels; anthers sessile or nearly so, the cells usually lateral, distinct, opening longitudinally. Carpels in the females numerous, sessile, occupying the whole disk without staminodia, with one pendulous ovule in each, and terminating in a short thick obtuse style. Fruiting carpels drupaceous, small numerous crowded and almost coherent in the Australian species, larger fewer and distinct (as in *Mollinedia* and *Kibara*) in other species. Seed with a fleshy albumen. Embryo small, with erect cotyledons.—Trees or shrubs. Leaves toothed or entire. Flowers in short axillary cymes or raceme-like panicles. Bracts small or none.

Besides the Australian species which is endemic, there is one from New Zealand and another from the islands of the S. Pacific.

1. *H. angustifolia* (leaves narrow), *A. Cunn. in Ann. Nat. Hist. Sér.* 1, i. 215; *Benth. Fl. Austr.* v. 291. A tall shrub or small tree, the young shoots and inflorescence slightly hoary-pubescent, the adult parts glabrous. Leaves on rather long petioles, from ovate-elliptical to oblong-lanceolate, shortly acuminate, acute or rarely rounded at the base, irregularly serrate-crenate or almost entire, mostly 3 to 4 in. long, rigidly membranous, penniveined and broadly reticulate. Flowers in short axillary raceme-like cymes, the pedicels very variable in length. Bracts usually very small or none, rarely larger and leaf-like. Perianth flatly hemispherical,  $2\frac{1}{2}$  to 3 lines diameter, with 8 or 10 small inflexed lobes. Stamens very numerous, covering the whole disk or concealing a very small central space. Female perianth at first smaller than the male, with smaller inflexed lobes, which become reflexed as the disk and carpels enlarge. Carpels very numerous, surrounded by a few abortive ones (or staminodia?). Drupes 10 to 20, nearly globular and succulent, each 1 to  $1\frac{1}{2}$  line diameter, all closely packed and almost connate in a globular fruit of 3 or 4 lines diameter. Endocarps crustaceous, minutely rugose.—*H. Cunninghamii*, Tul. in Arch. Mus. Par. viii. 408; *H. dentata*, var. *australasica*, Sond. in Linnæa xxviii. 228; *H. australasica*, A. DC. Prod. xvi. ii. 673; *H. pseudomorus*, F. v. M. in Trans. Phil. Inst. Vict. ii. 63, Pl. Vict. i. 23, t. suppl. 2.

Hab.: Mount Mistake and other southern localities.

#### 5. PIPTOCALYX, Oliv.

(From *pipto* to fall, and calyx).

Flowers polygamous. Perianth-tube or disk very short, segments about 6, nearly equal, in 2 rows, very deciduous. Stamens indefinite, filaments filiform;

anthers oblong-linear, adnate, the cells distinct and parallel, opening longitudinally; no rudimentary carpels in the male flowers. Hermaphrodite flowers with stamens as in the males and a single carpel, with a single pendulous anatropous ovule and a sessile broad stigma. Fruit unknown.—Woody climber. Leaves opposite, entire. Flowers in simple racemes, the males opposite with the terminal flower hermaphrodite.

The genus consists of the single Australian species. The habit is that of *Palmeria*, but the flowers are very different.

1. **P. Moorei** (after Charles Moore), *Oliv. in Herb. Kew.*; *Benth. Fl. Austr.* v. 292. A woody climber of 30 to 40ft. (*C. Moore*), the branches, inflorescence and principal veins on the underside of the leaves ferruginous with rather long soft hairs. Leaves petiolate, ovate-lanceolate, with a long narrow point, entire or obscurely crenate, rounded at the base, 4 to 5in. long,  $1\frac{1}{2}$  to  $1\frac{3}{4}$ in. broad, rather thin, shining above, pale opaque and minutely glandular-dotted underneath, the veins conspicuous on both sides. Petiole  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long. Racemes, terminal ones 1 to  $1\frac{1}{2}$ in long, the axillary ones shorter, the pedicels very short. Bracts small and very deciduous. Perianth-segments very deciduous, the outer ones ovate-orbicular,  $1\frac{1}{2}$  line long, hirsute outside, the inner ones elliptical or obovate-oblong, thin, all more or less dotted with immersed glands. Stamens about 15, about 1 line long, the filaments rather shorter than the anthers; anthers tipped by a short appendage to the connective. Ovary glabrous, oblong, about 1 line long.—F. v. M. Fragm. x. 106.

Hab.: Towards Wallangarra.

## 6. ATHEROSPERMA, Labill.

(Seed awned.)

Flowers diœcious. Perianth-tube campanulate, lobes 8 or rarely 10 in 2 rows. Stamens usually from as many to twice as many as perianth-lobes, without staminodia in the males; filaments flat, with a wing-like appendage on each side; anthers short, extrorse, with 2 distinct cells opening from the base upwards in convex valves, the connective truncate. Carpels in the females numerous in several rows, the outer ones imperfect, the inner ones with one erect ovule in each and tapering into long styles. Fruiting perianth-tube persistent, slightly enlarged, enclosing numerous narrow dry carpels, the long persistent terminal plumose styles exserted, the lobes deciduous. Pericarp and testa of the seeds thin; albumen fleshy. Embryo very small, with short erect cotyledons.—Trees. Leaves toothed or entire. Flowers axillary, in the Australian species solitary, in others in cymes of 3 to 7. The whole plant highly aromatic.

Besides the Australian species which is endemic, the genus comprises one from New Zealand.

1. **A. moschata** (musk scented), *Labill. Fl. Nor. Holl.* ii. 74, t. 224; *Benth. Fl. Austr.* v. 284. A tree attaining a large size, the young branches tomentose. Leaves ovate elliptical oblong or lanceolate, acute, coarsely and irregularly toothed or entire, contracted into a rather short petiole,  $1\frac{1}{2}$  to 3in. long, coriaceous, glabrous above, glabrous glaucous or white-tomentose underneath, the primary somewhat branched veins alone conspicuous. Flowers solitary on axillary peduncles of  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long, at length recurved. Bracts 2, close under the flower, ovate, acute, 4 or 5 lines long, silky inside and out, very deciduous. Male perianth-tube ovate-campanulate, about 3 lines long, silky outside, glabrous inside, the lobes 4 to 5 lines long, the outer ones broader than the inner. Stamens about 12, inserted round the top of the tube in about 3 rows, without staminodia or imperfect carpels. Female perianth with rather smaller more silky lobes than the males, the tube broader and villous inside. Carpels very numerous, villous, lining the whole disk and tube in numerous rows, the two or three outer rows abortive, considered by some as staminodia, but with the shape and hairs of the

carpels and tapering into a minute glabrous rudimentary style, the numerous inner carpels with elongated styles. Fruiting perianth with a persistent broadly campanulate tube 4 or 5 lines diameter, the lobes deciduous, but the outer abortive carpels somewhat enlarged and assuming the appearance of 2 or 3 rows of teeth to the perianth.—A. DC. Prod. xvi. ii. 676; Baill. Hist. Pl. i, 320, f. 360 to 364; Hook. f. Fl. Tasm. i. 12; F. v. M. Pl. Vict. i. 24.

Hab.: Near the border of N.S.W.

### 7. DORYPHORA, Endl.

(Spear bearing.)

(Learosa, Reichb.)

Flowers hermaphrodite. Perianth-tube campanulate, segments 6 in 2 rows. Stamens usually 6, perfect, opposite the perianth-segments round the orifice of the tube, with 6 to 12 staminodia within them; filaments short, with a wing-like appendage on each side, anthers extrorse, with 2 distinct cells opening from the base upwards in convex valves, the connective produced into a long linear-subulate appendage. Carpels several at the base of the tube with one ascending ovule in each. Style long, slightly lateral. Fruiting carpels included in the persistent perianth-tube, the segments deciduous, each carpel growing out laterally so that the long plumose style appears almost basal. Seed not seen perfect.—Tree. Leaves toothed. Flowers 3 together on short axillary peduncles. The whole plant highly aromatic.

The genus is limited to a single species endemic in Australia.

1. **D. sassafras** (Sassafras-like), Endl. Iconogr. t. 10; Benth. Fl. Austr. v. 283. A tree of considerable size but of irregular growth, glabrous except the inflorescence or young shoots hoary-tomentose. Leaves petiolate, ovate elliptical or oblong-lanceolate, acuminate, coarsely toothed, narrowed at the base, 2 to 4 in. long, nearly smooth on the upper side, prominently penniveined and reticulate underneath. Peduncles 2 to 3 lines long, with a pair of very deciduous bracts of 3 or 4 lines close under the flowers. Perianth-tube about 1 line long when in flower, enlarged and irregularly split when in fruit, segments about 4 lines long, lanceolate, very acute. Anther-appendages nearly as long as the perianth-segments. Carpels slightly hairy, the styles lengthening after fecundation into long plumose awns.—Tul. Monogr. Monim. 424; A. DC. Prod. xvi. ii. 676; Baill. Hist. Pl. i. 318, fig. 357 to 359.

Hab.: Logan River to border of N.S.W.

### 8. DAPHNANDRA, Benth.

(The anthers like those of a Daphne.)

Flowers hermaphrodite. Perianth-tube short, segments about 15 in about 3 rows. Stamens 4 or 5, opposite the inner segments; filaments flat, with a wing-like appendage on each side; anthers short, extrorse, with 2 distinct cells opening from the base upwards in convex valves, the connective truncate; staminodia (or abortive carpels?) 5 to 12 between the stamens and carpels. Carpels hairy several in 2 or 3 rows with one pendulous ovule in each, and tapering into the hairy style. Fruiting perianth enlarged at the base or middle, bursting longitudinally; carpels dry, hairy, with a bristle-like hairy persistent style.—Trees. Leaves serrate or almost entire. Flowers small, axillary or terminal.

The genus is limited to Australia. With the stamens of *Atherosperma* it has the inflorescence and pendulous ovules of *Mollinedia*.—Benth.

Leaves serrate, 3 to 4 in. long . . . . . 1. *D. micrantha*.  
Leaves minutely serrate, 4 to 7 in. long . . . . . 2. *D. repandula*.  
Leaves entire or with a few distant teeth, 2 to 6 in. long . . . . . 3. *D. aromatica*.

1. **D. micrantha** (flowers small), Benth. Fl. Austr. v. 285. A handsome large tree, young growth much flattened at the joints, quite glabrous or

the young inflorescence minutely hoary. Leaves petiolate, oblong-lanceolate or elliptical, acuminate, more or less serrate, contracted at the base, 3 to 4 in. long, green on both sides, the primary veins oblique and anastomosing. Panicles shorter than the leaves, the flowers not numerous. Bracts scarcely 1 line long, very deciduous. Perianth-tube short and broad, outer segments broad, about 1 line diameter, inner ones narrower and more petal-like. Stamens not exceeding the perianth. Carpels of the ovary glabrous or slightly hairy, sessile in the hairy receptacle. Fruiting perianth narrow, about 1 in. long. Carpels hairy, with glossy brown hairs.—*Atherosperma micranthum*, Tul. Monogr. Monim. in Archiv. Mus. Par. viii. 421, t. 34; Alph. DC. Prod. xvi. ii. 676.

Hab.: Moreton Bay, *Fraser, W. Hill*. Common in southern scrubs.

Wood of a glossy-yellow colour, close-grained and firm, stands well in seasoning; useful for cabinet-work and for carving.—*Bailey's Cat. Ql. Woods*, No. 309.

2. **D. repandula** (slightly repand), *F. v. M. Fragm.* x. 105. A moderate sized tree, the young branches tomentose. Leaves thin chartaceous, 4 to 7 in. long, long-acuminate at the apex, the margins slightly repand or crenate; nerves very oblique, the upper ones distant, hairy with short hairs. Panicles axillary, very slender, about 3 in. long. Perianth minute, glandular-fringed. Fruiting perianth about 9 lines long, dark, enlarged above the middle, thence tapering towards each end. Seeds fusiform, 3 lines long, covered with light-brown glossy hairs as long as the seed itself.

Hab.: The tropical scrubs.

Wood of a light-brown colour, nicely figured, grain close; would probably serve for engraving. Considered to closely resemble the English Holly.—*Bailey's Cat. Ql. Woods*, No. 309a.

3. **D. aromatica** (aromatic), *Bail. 1st Suppl. Syn. Ql. Fl.* 46. "Cheedingnan," Barron River, *J. F. Bailey*. Trees of moderate size and sweet aromatic bark. Leaves opposite, lanceolate, entire or with few distant often indistinct teeth, 2 to 6 in. long, and from  $\frac{1}{2}$  to  $1\frac{1}{4}$  in. wide in the centre, with often a narrow elongated point, on petioles of 3 or 4 lines long, the principal ateral transverse veins joining far within the margin and forming a prominent intramarginal one. Inflorescence axillary or terminal. Peduncle solitary, or several when terminal, about 4 lines, bearing usually at the end 2 pedicellate flowers. Fruiting perianth about 9 lines long, black and rough on the outside, enlarging at the base. Carpels densely hairy.

Hab.: Johnstone River and other tropical scrubs.

Wood of a light colour, not unlike Pine wood, for which it would form a substitute.—*Bailey's Cat. Ql. Woods*, No. 308a.

Dr. Thos. L. Bancroft, who examined the barks of these trees some years ago, found them to contain several alkaloids which were respiratory and cardiac poisons.

## ORDER CX. LAURINEÆ.

Perianth regular, the tube very short or none at the time of flowering, sometimes enlarged over or under the fruit, or rarely adnate to the ovary and fruit; segments 6 or rarely fewer, all equal or 3 outer ones smaller, imbricate in the bud. Stamens normally twice as many as perianth-segments, 6 opposite them with introrse anthers, 6 within and opposite to the outer ones with the anthers extrorse in some genera, introrse in others, but in many genera 3 or sometimes all of the inner stamens, and in other 3 or all of the outer ones reduced to short staminodia or wanting, and in some flowers the stamens abnormally and irregularly increased or diminished in number; there are also frequently a pair of sessile or stipitate rather large glands, one on each side of the filament either of the inner or rarely of the outer of the two stamens opposed to the inner perianth-segments; anthers adnate, with 2 collateral cells or 2 superposed pairs of cells, each cell opening in a valve from the base upwards or



in *Hernandia* from the inner to the outer side. Ovary free, or in *Hernandia* adnate, consisting of a single carpel with one ovule suspended from the apex of the cavity from a funicle adnate to its side, or rarely with a second small abortive ovule. Style simple, often very short, with a capitate disk-shaped or obliquely dilated stigma, entire or shortly and irregularly lobed. Fruit a berry or drupe, rarely dry or nearly so, the perianth entirely deciduous, or the tube enlarged and disk-shaped or cup-shaped under the fruit or more or less succulent and closing over it or adnate to it. Seed pendulous, with a membranous or (in *Hernandia*) a hard testa, without albumen. Embryo with thick fleshy cotyledons filling the seed, enclosing the plumula and short superior radicle.—Trees or shrubs with alternate or rarely irregularly opposite leaves, more or less glandular-dotted and aromatic (except in *Hernandia*) usually entire and evergreen, or, in *Cassytha*, leafless parasitical twiners. Stipules none. Flowers usually small, in cymes reduced sometimes to clusters umbels or heads, the cymes solitary or arranged in racemes, clusters or panicles; or, in *Cassytha*, the flowers singly arranged in spikes or racemes.

A considerable Order, abundant in tropical Asia and America, less so in Africa, with a very few species penetrating into more temperate regions both in the northern and southern hemisphere.

TRIBE I. **Perseaceæ**.—Trees or shrubs with perfect leaves. Flowers in cymes umbels or clusters, which are clustered or arranged in racemes or panicles, rarely solitary. Anther-valves opening upwards. Seeds with distinct thick and fleshy cotyledons.

Three stamens, belonging to the inner series, with extrorse anthers.

Anthers 2 celled.

Stamens of the outer series (usually 6) perfect.

Ovary more or less immersed in the perianth-tube, which completely encloses the fruit . . . . .

1. CRYPTOCARYA.

Ovary not immersed. Perianth completely deciduous . . . . .

2. BEILSCHMIEDIA.

Stamens of the outer series reduced to a thick prominent ring or entirely deficient. Perianth deciduous or scarcely enlarged under the fruit . . . . .

3. ENDIANDRA.

Anthers 4-celled. Stamens of the outer series (usually 6) perfect. Perianth scarcely enlarged under the fruit . . . . .

4. CINNAMOMUM.

Perianth enlarging under the fruit . . . . .

5. PERSEA.

TRIBE II. **Litseaceæ**.—All the stamens with introrse anthers. Flowers dioecious, in heads or umbels, with an involucre of about 4 bracts.

Perfect stamens, 6 to 9, more or less. Perianth 4 to 6-merous . . . . .

6. LITSEA.

TRIBE III. **Cassytheæ**.—Leafless parasitical twiners. Flowers in spikes or racemes. Anther-valves opening upwards.

Single genus . . . . .

7. CASSYTHA.

SCORDER IV. **Hernandieæ**.—Trees with perfect leaves. Flowers monocious, the female with an involucre which enlarges and encloses the fruit. Anther-valves opening laterally. Seeds without albumen.

Single genus . . . . .

8. HERNANDIA.

## 1. CRYPTOCARYA, R. Br.

(Nut hidden in the perianth-tube.)

(Caryodaphne, Blume.)

Flowers hermaphrodite. Perianth segments 6, equal or nearly so. Stamens of the outer series 6, all perfect with introrse anthers, of the inner series 3 with extrorse anthers, alternating with 3 short staminodia; glands 6 at the base of the inner perfect stamens or almost as near to the outer ones opposed to them. Anthers all 2-celled. Ovary immersed in the perianth-tube which after flowering closes over the ovary, and finally becomes more or less fleshy or succulent, completely enclosing and usually consolidated with the fruit, the limb of the perianth deciduous leaving a small scar at the apex or rarely persistent.—Trees or tall shrubs. Flowers small, in cymes arranged in axillary racemes or panicles, the

upper ones often forming an apparently terminal panicle with the subtending leaves very small or deficient. Fruiting perianths globular ovoid or oblong, having the appearance of inferior fruits.

The genus is chiefly Asiatic, with a few species from S. Africa and S. America. The Australian species appear to be all endemic.

Nees and Meissner distinguish *Caryodaphne* from *Cryptocarya* by the triplinerved leaves and the adherence of the fruiting perianth-tube to the pericarp, but I can find no difference in the latter respect between the fruits of the typical *C. glaucescens* and those of *C. triplinervis*, and the triplinerved venation, though well marked in two species and in some leaves of *C. triplinervis*, passes gradually into the penniveined arrangement in other leaves of the latter species, and in no case draws any natural line of demarcation between the two.—*Benth.*

Inflorescence pubescent or villous.

Leaves penniveined with the reticulations very conspicuous underneath, scarcely so above.

Panicles very villous, compact. Leaves 6 to 10in. long. Fruit nearly globular. . . . . 1. *C. Murrayi*.

Panicles tomentose-pubescent, loose and many-flowered. Leaves 4 to 8in. long. Fruit ovoid . . . . . 2. *C. Mackinnoniana*.

Panicles tomentose-pubescent, loose, few-flowered. Leaves 2 to 5in. long, softly pubescent underneath till old, the reticulations less raised than in the two preceding species. Fruit oblong . . . . . 3. *C. patentinervis*.

Leaves penniveined, the reticulations faint or equally prominent on both sides. Fruit globular.

Leaves thickly coriaceous, smooth and shining above, the primary veins very prominent underneath, the reticulations inconspicuous . . . . . 4. *C. obovata*.

Leaves more or less coriaceous, the reticulations fine, conspicuous or obsolete on both sides . . . . . 5. *C. glaucescens*.

Leaves more or less triplinerved or quintaplinerved.

Leaves usually pubescent underneath, triplinerved, passing into penniveined. Fruit ovoid . . . . . 6. *C. triplinervis*.

Leaves glaucous or white underneath, prominently triplinerved. Fruit globular . . . . . 7. *C. cinnamomifolia*.

Inflorescence glabrous. Panicles small and loose.

Leaves penniveined, the veins scarcely prominent . . . . . 8. *C. Meissneri*.

Leaves more or less prominently triplinerved . . . . . 9. *C. australis*.

The four following species are placed here provisionally, the flowers not having been examined.

Fruit oblate, the transverse diameter 1½in. Pericarp ribbed, fleshy . . . . . 10. *C. oblata*.

Fruit red, depressed-globose, 2in. diameter. Pericarp succulent . . . . . 11. *C. gravecolens*.

Fruit 2½in. long and nearly the same in diameter. Pericarp irregularly corrugated . . . . . 12. *C. Palmerstonii*.

Fruit 2in. long, 1½in. diameter, pointed at each end. Pericarp thin . . . . . 13. *C. Bancroftii*.

1. **C. Murrayi** (after J. J. Murray). *F. v. M. Fragm.* v. 170; *Benth Fl. Austr.* v. 295. A large tree, the young branches stout and softly tomentose-villous, more or less ferruginous. Leaves shortly petiolate, oblong oval or elliptical, obtuse or shortly acuminate, 6 to 10in. long, glabrous above when full grown or the midrib minutely pubescent, very prominently penniveined and reticulate underneath, the veins rusty-pubescent, somewhat glaucous between them. Panicles short compact and villous. Flowers sessile in the cymes. Perianth hirsute, the segments rather longer than the tube (about 1 line), almost acute. Glands scarcely connected with the inner stamens, stipitate; staminodia thick, rather sessile, acute. Fruiting perianth ovoid or nearly globular, shining, about ½in. diameter.

Hab.: Rockingham Bay. *Dallachy*; Barron River and other tropical scrubs.

Wood of a dark colour, hard and close-grained.—*Bailey's Cat. Qt. Woods*, No. 310.

2. **C. Mackinnoniana** (after L. Mackinnon). *F. v. M. Fragm.* v. 169; *Benth. Fl. Austr.* v. 296. "Koonjoongaroo," Barron River, *J. F. Bailey*. A noble tree of 100ft. high (*Dallachy*) or a tall shrub of 12ft. (*W. Hill*), the young branches petioles and inflorescence minutely rusty-pubescent. Leaves oblong or almost ovate, obtuse or shortly acuminate, rounded or cuneate at the base, 4 to 8in. long, rather thick, at first minutely pubescent, at length glabrous and almost

shining above, very prominently penniveined and reticulate underneath, the veins rusty-pubescent, often glaucous between them. Panicles loosely corymbose or thyrsoid. Pedicels very short. Perianth scarcely above 1 line long, the segments about as long as the tube. Glands large, free from the inner stamens, nearly sessile. Fruiting perianth ovoid or oblong, about  $\frac{3}{4}$  in. long.

Hab.: Cape York, *W. Hill*; Rockingham Bay, *Dallachy*; also in other tropical scrubs.

Wood of a grey colour, close-grained and hard.—*Bailey's Cat. Ql. Woods*, No. 310A.

3. **C. patentinervis** (nerves spreading), *F. v. M. in DC. Prod.* xv. i. 508 and *Fragm* v. 166; *Benth. Fl. Austr.* v. 296. A small tree, the branches and inflorescence ferruginous or hoary with a close tomentum. Leaves ovate to oblong-lanceolate, acuminate, 2 to 4 in. long, glabrous above, softly or minutely pubescent and more or less glaucous underneath, the primary veins prominent, the reticulate veinlets also somewhat conspicuous. Cymes sometimes solitary in the axils, more frequently several in short terminal thyrsoid panicles, the flowers not numerous, hoary-pubescent. Perianth  $1\frac{1}{2}$  line long, the tube turbinate, rather shorter than the lobes. Glands of the inner stamens shortly stipitate. Staminodia sessile, thick, acuminate. Fruiting perianth ellipsoid-oblong, nearly  $\frac{1}{2}$  in. long, the pericarp rather more distinct from it than in most species.—*C. rigida*, Meissn. in *DC. Prod.* xv. i. 508.

Hab.: Towards the Tweed River, *Rev. B. Scortechini*.

Wood of a light colour marked with black streaks and spots, hard and tough.—*Bailey's Cat. Ql. Woods*, No. 310B.

4. **C. obovata** (obovate), *R. Br. Prod.* 402; *Benth. Fl. Austr.* v. 296. A fine bushy-headed tree, the young shoots and inflorescence minutely tomentose and more or less ferruginous. Leaves oblong to obovate, very obtuse and 2 to 4 in. long in the typical form, larger broader and sometimes shortly and obtusely acuminate in northern specimens, rather thick, the margins often recurved, glabrous with the veins scarcely conspicuous above, often glaucous or even very minutely pubescent when young underneath, with the primary pinnate veins very prominent, the reticulations scarcely conspicuous. Panicles loosely thyrsoid, numerous and many flowered, the upper ones forming a terminal panicle. Flowers rather larger than in *C. glaucescens*. Perianth-segments as long as the oblong tube. Glands stipitate, appearing to belong as much to the outer as to the inner staminal series. Staminodia sessile, acuminate. Fruiting perianth globular, about  $\frac{1}{2}$  in. diameter.—Meissn. in *DC. Prod.* xv. i. 73, 507; *C. hypospodia*, *F. v. M. Fragn.* v. 170.

Hab.: Rockingham Bay, *Dallachy* (with large leaves); Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller*, *W. Hill*.

Wood of a light colour, very tough; a useful wood if not exposed to the weather.—*Bailey's Cat. Ql. Woods*, No. 311.

Var. *tropica*. The northern form with broader leaves.

Wood of a light-colour, close-grained and tough.—*Bailey's Cat. Ql. Woods*, No. 311A.

5. **C. glaucescens** (greyish), *R. Br. Prod.* 402; *Benth. Fl. Austr.* v. 297. A tree of 40 ft. and upwards, the young branches and petioles minutely pubescent when young but soon becoming glabrous, the inflorescence usually hoary-pubescent. Leaves ovate-elliptical or oblong, obtuse or shortly acuminate, shortly contracted at the base, flat, not usually so rigid as in *C. obovata*, penniveined and reticulate but the veins rather fine and the reticulations little conspicuous or in some varieties conspicuous or even prominent on both sides, both surfaces green or somewhat glaucous, rarely above 4 in. long in flowering specimens, but larger on luxuriant shoots. Flowers numerous, shortly pedicellate, in thyrsoid panicles shorter or longer than the leaves, the upper ones often forming a large terminal panicle. Perianth 1 to  $1\frac{1}{4}$  line long, hoary-pubescent, the tube oblong when fully out, turbinate when young, the segments about as long

as the tube or rather longer. Glands stipitate, appearing to belong as much to the outer as to the inner filaments. Staminodia acuminate. Fruiting perianth depressed-globular,  $\frac{1}{2}$  to nearly  $\frac{3}{4}$  in. diameter.—Meissn. in DC. Prod. xv. i. 72.

Hab.: Rockingham Bay, *Dallachy*; Rockhampton, *Thozet*, *Dallachy*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller*, and others.

Wood of a light colour, easily worked, and likely to prove useful for many purposes.—*Bailey's Cat. Ql. Woods*, No. 312.

*Asterina cryptocarya*, Cke., is met with on the leaves.

Var. *reticulata*, Meissn. Veins of the leaves more conspicuous on both sides but fine.—*C. micronera*, Meissn. l.c.—Southern localities.

Var. *coriacea*. Leaves thick, rigid, and more prominently reticulate, often very glaucous underneath.—Rockingham Bay, *Dallachy*.

Var. *nitida*. Leaves coriaceous and shining with fine veins, green on both sides or scarcely glaucous.—*C. Moretoniana*, Meissn. l.c. 74.—Moreton Bay, *A. Cunningham*; Archer's Creek, *Leichhardt*.

*C. Bidwillii*, Meissn. l.c. 74, of which the specimens from Wide Bay, *Bidwill*, are in young fruit only, and not satisfactory, may be the same variety.—*Benth*.

All the above varieties run much one into the other, and in view of the large number of specimens I have had before me, it seems impossible to consider any of them as species permanently distinct.—*Benth*.

6. *C. triplinervis* (3-nerved), *R. Br. Prod.* 402; *Benth. Fl. Austr.* v. 297. A tall tree. Leaves ovate-elliptical or oblong-lanceolate, acuminate, glabrous above, more or less pubescent underneath, rarely above  $\frac{1}{2}$  in. long, triplinerved or more or less irregularly penninerved with 2 to 5 primary veins on each side of the midrib, sometimes very prominent underneath sometimes fine, the reticulations not very conspicuous. Panicles dense short and thyrsoid in the axils, or the upper ones much branched forming a terminal panicle with numerous flowers, hoary-pubescent with appressed hairs or more frequently hirsute with spreading hairs. Flowers nearly sessile. Perianth-tube cylindrical, about 1 line long, the segments narrow and nearly as long. Stamens nearly as long as the perianth, the glands stipitate, as near to the outer as to the inner stamens; staminodia rather narrow, acuminate. Fruiting perianth ovoid, about  $\frac{1}{2}$  in. long.—*Caryodaphne Browniana*, Nees. Syst. Laurin. 230; Meissn. in DC. Prod. xv. i. 78.

Hab.: E. coast. *R. Brown*; Edgecombe and Rockingham Bays, *Dallachy*; Port Denison, *Fitzalan*; Rockhampton, *Dallachy*, *O'Shaneys*, and others; Cape River, Crocodile and Nerikool Creeks. *Bourman*; Archer's Creek, *Leichhardt*; Brisbane River, Moreton Bay, *Leichhardt*, *F. v. Mueller*, *W. Hill*, and others.

There are two or three marked forms of foliage, but with occasional intermediates and sometimes the leaves of the principal branches different as to venation from those of the younger branches of the same specimen. In the more typical forms the leaves are rather thick, prominently triplinerved or quintuplinerved and softly pubescent underneath, in other forms the primary veins are more numerous, and in some of the northern specimens the leaves are often almost glabrous and almost as penninerved as in *C. glaucescens*. The fruit appears to be always differently shaped from that of *C. glaucescens*, although the perianth-tube is equally consolidated with the pericarp in both species.—*Benth*.

Wood of a grey colour, close in grain and tough.—*Bailey's Cat. Ql. Woods*, No. 313.

In the bark of this species, and also that of *C. australis*, Dr. Thos. L. Bancroft detected an intensely bitter poisonous alkaloid.

Specimens of this plant were sent to me a few years ago, with the statement that the tree had caused the death of some pigs which had eaten the leaves.

7. *C. cinnamomifolia* (Cinnamon-leaved), *Benth. Fl. Austr.* v. 298. A tree of 40ft. (*Dallachy*), the young shoots and inflorescence minutely ferruginous-tomentose. Leaves ovate or broadly elliptical, acuminate, cuneate at the base, rigidly coriaceous, prominently triplinerved, glabrous above, glaucous or white underneath, with the reticulations conspicuous, 3 to 6 in. long. Panicles axillary or in terminal panicles, short and dense in the specimens seen but as yet only

in young bud and the form of the perianth not ascertained. Stamens of *Cryptocarya*, but as yet very young. Fruit depressed globular, above  $\frac{1}{2}$  in. diameter, very similar to that of *C. glaucescens*.

Hab.: Rockingham Bay, *Dallachy*.

Var. *parvifolia*. Leaves deep green, ovate, 3-nerved, about 2 in. long. Fruit black, globular.

—Hab.: Top of Mount Mistake Range.

Wood of fine grain, easy to work, of a light colour.—*Bailey's Cat. Ql. Woods*, No. 313A.

8. **C. Meissneri** (after C. F. Meissner), *F. r. M. Fragm.* v. 170; *Benth. Fl. Austr.* v. 298. A small or large tree, quite glabrous in every part. Leaves elliptical or oblong-lanceolate, obtusely acuminate, contracted into a short petiole, mostly about 2 in. and rarely above 3 in. long, rather thick, penniveined but the veins irregular and even the primary ones not very prominent. Panicles short, axillary and terminal, the flowers not numerous and quite glabrous outside. Perianth-tube narrow, at first turbinate, ovoid and contracted at the top when fully out and  $\frac{3}{4}$  line long, the lobes nearly as long, minutely hairy inside. Stamens much shorter than the perianth, the glands sessile but as near to the outer as to the inner stamens. Ovary immersed in the perianth-tube, Fruit not seen.—*C. hypoglauca*, var. *attenuata*, Meissn. in DC. Prod. xv. i. 508 (F.v.M.).

Hab.: Logan River, *Rev. B. Scortechini*.

9. **C. australis** (Australian), *Benth. Fl. Austr.* v. 299. A large shrub or small tree, quite glabrous in all its parts. Leaves ovate elliptical or almost oblong, acuminate, contracted into a short petiole, coriaceous or thin, pale underneath but not at all white, more or less prominently triplinerved, 2 to 4 in. long. Panicles very loose, few-flowered, always much shorter than the leaves and quite glabrous. Pedicels rather long. Perianth-tube turbinate, nearly 1 line long, the lobes at least as long, ovate and more spreading than in other species. Stamens short, especially the 3 inner ones. Ovary immersed in the tube. Fruiting perianth obovoid, pear-shaped, usually globose, sometimes nearly  $\frac{3}{4}$  in. long, usually crowned by the remains of the perianth-limb, on some trees yellow, on others crimson.—*Laurus Bowiei*, Hook. Journ. Bot. iv. 419, t. 23; *Oreodaphne Bowiei*, Walp. Ann. i. 576; *Laurus australis*, A. Cunn.; Hook. Bot. Mag. under n. 3931; *Caryodaphne australis* A. Braun; Meissn. in DC. Prod. xv. i. 77.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham* and many others; Rockingham Bay, *Dallachy*.

The specific name *Bowiei* was originally given to this plant under a mistake as to the origin of the seeds from which it was raised at Kew, and was therefore afterwards suppressed by Hooker himself, and Cunningham's name adopted.—*Benth.*

Wood light-coloured, close-grained, easily worked; suitable for lining-boards.—*Bailey's Cat. Ql. Woods*, No. 314.

10. **C. oblata** (oblate) *Bail. Bot. Bull.* ix. 11. This is said to be a tree of considerable size. The young growth and inflorescence covered with a more or less dense clothing of short bright ferruginous hairs, but soon becoming perfectly glabrous; branchlets very angular, nearly black, with numerous light-coloured lenticelles; leaves broadly lanceolate with elongated points, attaining 5 or more inches in length, the primary veins few, distant, and not very prominent, and the reticulation somewhat faint; texture membranous; petioles short; fruit oblate and laterally compressed, the broadest diameter about  $1\frac{1}{2}$  in., marked by prominent ribs, the fleshy covering softer and more juicy than usual in the genus. The perianth appears to be more persistent in this than in any other Australian species of the genus; but I could find none perfect enough to describe any of the parts, except, I might observe, that the staminodia seemed large and to resemble those of *C. Wightiana*, Thwaites.

Hab.: Daintree River, *E. Cowley*.

11. **C. graveolens** (heavy-scented), *Bail. Bot. Bull.* ii. 16. "Gir-irjal," Johnstone River, *Wm. C. Harding*. Tree attaining 80 to 100ft. in height and 2 or more feet diameter of stem. Branches smooth and angular. Leaves often opposite, oblong, coriaceous, 6 to 11in. and  $2\frac{1}{2}$  to  $3\frac{3}{4}$ in. broad, primary veins looping within the margin like those of an *Eugenia*, upper side glabrous and glossy, underside thinly puberulous; petiole  $\frac{1}{2}$ in. Panicles or racemes terminal, about 4in. long. Flowers not seen. Fruit red, resembling a bergamot pear in shape, 2 to 3in. diameter, outer succulent part when fresh having a sharp acid flavor, inseparable from the endocarp, substance of the thick cotyledons thickly studded with large cells full of a bright-yellow resin having a strong disagreeable odour.

Hab.: Tringilburra Creek, *Bellenden Ker Expedition*, 1889; Johnstone River, *Dr. T. L. Bancroft*; Tully River and Atherton, *J. F. Bailey*.

12. **C. Palmerstonii** (after Christie Palmerston), *Bail. Bot. Bull.* ii. 16. Black Walnut. "Koi-ie" Barron River, *J. F. Bailey*; "Pal-la-ga," Atherton, *Roth*. Tree of large size, girth at base 36ft., tapering proportionally upwards as straight as an arrow for 80 or 100ft. before branching; branches pithy (*C. Palmerston*). Branchlets compressed or irregularly angular. Leaves alternate, oval-oblong, rounded or slightly tapering at the base; apex obtusely acuminate, 4 or 5in. long and about 2in. broad, upper surface glabrous and glossy, under clothed with a close light-coloured tomentum; primary veins about 8 pairs prominent, the smaller reticulations somewhat indistinct; petioles  $\frac{1}{2}$ in. or rather more long. Fruit about  $2\frac{1}{2}$ in. long and nearly as much in diameter, more or less prominently marked by irregular longitudinal corrugations, pericarp becoming hard and brittle, enclosing a round free-nut of more than 1in. diameter, with a thin hard brittle shell, the interior filled by the large thick fleshy cotyledons, the oil or resin cells of which are very minute and only visible under a strong lens.

Hab.: Russell and Barron Rivers.

Fruit eaten after being roasted, beaten up, and steeped in running water.

13. **C. Bancroftii** (after Dr. T. L. Bancroft), *Bail. Bot. Bull.* ii. 16. Red Walnut. "Bara," Tully River, *Roth*. A glabrous tree of medium size. Branchlets slender. Leaves alternate or at times nearly opposite, lanceolate, 4 or 5in. long, 1 to  $1\frac{1}{2}$ in. broad in the centre, tapering towards a slender petiole scarcely over a  $\frac{1}{4}$ in. long, apex bluntly acuminate, penniveined with more or less conspicuous reticulations on both sides. Racemes terminal or in the upper axils about 4in. long. Flowers not seen. Fruit about 2in. long, with a diameter of  $1\frac{1}{2}$ in., on a thickened pedicel of about  $\frac{1}{2}$ in., rough, the apex pointed and tapering much at the base; the outer covering forming but a thin bark to the endocarp or shell of the nut, testa brown, the thick cotyledons which form the kernel white, not dark-brown as in *C. Palmerstoni*, the oil-cells very minute, and only visible under a strong lens.

Hab.: Johnstone River, *Dr. T. L. Bancroft*; other scrubs of tropical Queensland, *Bellenden Ker Expedition*.

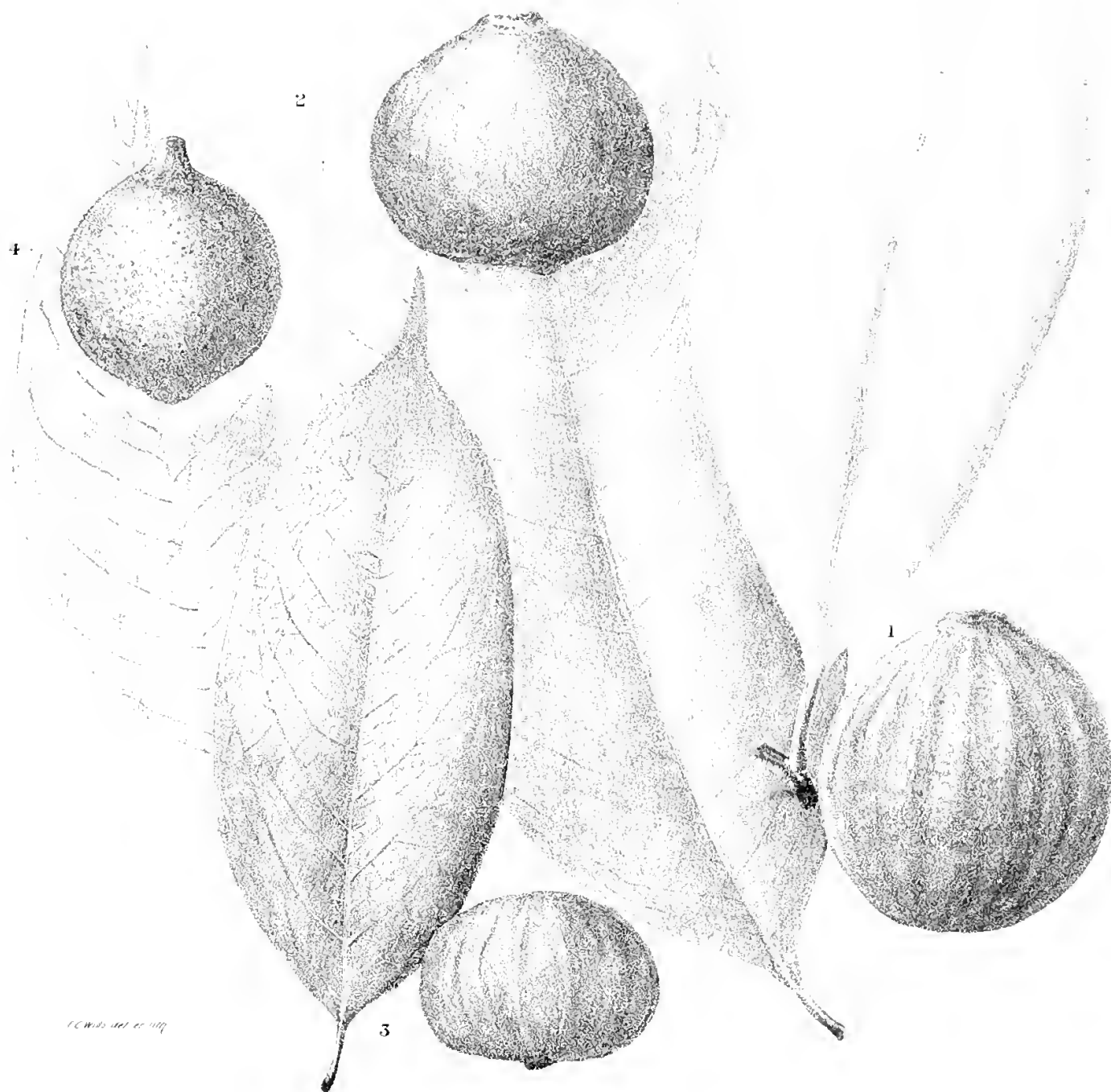
The fruit of this tree, which is used in a similar manner to *C. Palmerstoni*, is much more abundant than any of the other kinds.

## 2. BEILSCHMIEDIA, Nees.

(After O. S. Beilschmiedius).

(*Nesodaphne*, *Hook. f.*)

Flowers small, usually hermaphrodite, fascicled on paniculate. Perianth-tube short; lobes 5 subequal. Perfect stamens 9; filaments of 1st and 2nd series eglandular with introrse 2-celled anthers, of 3rd series 2-glandular with extrorse



*Cryptocarya*

1. *Palmerstoni*, Bail.

2. *graveolens* Jac.

3. *Bancroftii*, Bail.

4. *oblata*, Bail.





anthers; staminodia of 4th series ovoid or cordate. Fruit ovoid oblong or globose, perianth wholly deciduous.—Evergreen trees or shrubs. Leaves alternate or opposite penninerved.

Species all tropical, the Queensland ones endemic.

Flowers hermaphrodite . . . . . 1. *B. obtusifolia*.  
Flowers polygamous . . . . . 2. *B. lachnostemonea*.

1. **B. obtusifolia** (leaves obtuse), *Benth.* in *Benth.* and *Hook.* Gen. Pl. iii. A large and handsome tree, the young shoots and inflorescence sprinkled with minute appressed hairs, otherwise glabrous. Leaves elliptical oblong or oval-oblong, obtuse or obtusely acuminate, narrowed at the base into a short petiole, rather rigid, green on both sides, penniveined and loosely reticulate, 2 to 4 in. long. Cymes large and rather broad, the upper ones in a broad pyramidal or almost corymbose terminal panicle. Pedicels thick and  $\frac{1}{2}$ -line long above the small bracteoles. Perianth-tube very short and broad, the segments 1 line long. Stamens opposed to the outer segments broad, those opposed to the inner ones narrow; glands stipitate or almost sessile, attached to the inner stamens; staminodia sessile, thick, acute. Berry elliptical-oblong, the whole perianth deciduous.—*Cryptocarya obtusifolia*, F. v. M.; Meissn. in DC. Prod. xv. i. 508; *Nesodaphne obtusifolia*, Benth. Fl. Austr. v. 299.

Hab.: Rockingham Bay, *Dallachy*; Fitzroy River, *Bowman*; Rockhampton, *Thozet*; Archer's Creek, *Leichhardt*; and other tropical localities.

2. **B. lachnostemonea** (stamens woolly), *F. v. M. Vict. Nat. May*, 1892. Leaves mostly ovate or elliptic-lanceolate, protracted into a short blunt point, glabrous, closely reticulately veined on both sides, shining. Panicle beset with minute appressed hairs. Perianth-segments almost of equal length, nearly oval, connate towards their bases. The 6 stamens of the first series somewhat shorter than the perianth-segments, the 3 of the second series still shorter, the filaments all brownish-lanuginous; staminodia 3, very short. Pistil in staminate flowers narrow-conic, glabrous, with a minute stigma.

Hab.: Russell River, *H. Sayer* (F. v. M. l.c.).

### 3. ENDIANDRA, R. Br.

(Referring to the fertile anthers being the inner series.)

(*Dictyodaphne*, *Blume.*)

Flowers hermaphrodite. Perianth-segments 6, equal or nearly so. Stamens of the outer series reduced to a thick prominent ring below the perianth-segments or entirely wanting, of the inner series 3, with extrorse or semi-extrorse anthers, alternating sometimes with 3 small staminodia which are often deficient; glands either 6 at the base of the perfect stamens but free from them or none. Ovary not immersed. Berry free, resting on the wholly or partially persistent but not at all or scarcely enlarged perianth.—Trees. Leaves alternate. Flowers in axillary panicles, sometimes almost reduced to single cymes. Fruits oblong or globular.

The genus extends over the Indian Archipelago to the eastern provinces of India. The Australian species appear to be all endemic.

Perianth-tube small and turbinate, the limb broad and very open or when closed much broader than the tube.

Outer stamens replaced by a thick fleshy ring round the base of the perianth-segments.

Panicles thyrsoïd. Flowers 2 to 2½ lines diameter. Bracts very deciduous. Leaves glabrous . . . . . 1. *E. glauca*.

Panicles narrow, raceme-like. Flowers 3 to 4 lines diameter. Bracts persistent. Leaves rusty-pubescent or villous underneath . . . . . 2. *E. hypotephra*.

Outer stamens entirely deficient. Small staminodia usually present between the inner ones.

- Leaves white underneath, the primary veins prominent . . . . . 3. *E. discolor*.  
 Leaves green and reticulate on both sides . . . . . 4. *E. Sieberi*.  
 Perianth-tube thick and fleshy, broader than the connivent segments.  
 Leaves green on both sides. Flowers small.  
 Leaves glabrous. Staminal glands present.  
 Leaves mostly oblong, much reticulate. Perianth not 1 line diameter . . . . . 5. *E. virens*.  
 Leaves mostly elliptical-ovate, less reticulate, the primary veins more prominent. Perianth  $1\frac{1}{2}$  lines diameter . . . . . 6. *E. Muellieri*.  
 Leaves pubescent or villous underneath. No staminal glands . . . . . 7. *E. pubens*.  
 Branchlets slender. Leaves glabrous, ovate-lanceolate, 2 to  $2\frac{1}{2}$  in. long, primary nerves distant, reticulations prominent on both sides . . . . . 8. *E. Cowleyana*.  
 Branchlets silky. Leaves 2 to 5 in. long,  $1\frac{1}{2}$  to 2 in. broad. Fruit about 1 in. long, black, narrow-ellipsoid . . . . . 9. *E. dichrophylla*.  
 Branchlets with a thin brown tomentum. Leaves 5 in. long,  $1\frac{3}{4}$  in. broad, reticulations close. Fruit large, globular . . . . . 10. *E. exostemonea*.  
 Branchlets glabrous. Leaves lanceolate, 3 to 5 in. long, primary nerves very oblique, distant. Fruit globular, somewhat pointed at each end, rich pink,  $1\frac{1}{4}$  in. diameter . . . . . 11. *E. Lowiana*.  
 Branchlets 4-angular, ferruginous-tomentose. Leaves elliptical-oblong, 3 to 5 in. long,  $2\frac{1}{2}$  in. broad. Fruit globular, often compressed, black, 1 to  $1\frac{1}{2}$  in. diameter . . . . . 12. *E. Sankeyana*.  
 Branchlets bluntly-angular and densely ferruginous-tomentose. Leaves oval, 6 to 8 in. long, primary nerves distant. Fruit a rich pink, pear-shaped,  $2\frac{1}{2}$  in. diameter . . . . . 13. *E. insignis*.  
 Branchlets slender, more or less ferruginous-tomentose. Leaves oblong, 4 to  $5\frac{1}{2}$  in. long, primary nerves 14 on each side of midrib. Fruit orbicular, flattened somewhat lenticular, purple, 1 to  $1\frac{1}{2}$  in. broad . . . . . 14. *E. tooram*.

1. ***E. glauca*** (grey), *R. Br. Prod.* 402; *Benth. Fl. Austr.* v. 300. A small tree, the young shoots and inflorescence minutely ferruginous-tomentose. Leaves elliptical-oblong, acuminate, contracted at the base, mostly 3 to 5 in. long, glabrous and green above, glaucous or white underneath, otherwise glabrous or the very prominent primary veins minutely ferruginous-tomentose. Panicles thyrsoid, rather loose, shorter than the leaves, the bracts small and very deciduous. Pedicels short. Perianth-tube turbinate, much narrower than the limb, which spreads to 2 or  $2\frac{1}{2}$  lines diameter. Staminodia of the outer row forming a thick fleshy crenulate ring bordering the orifice of the tube and enclosing the ovary, the 3 inner stamens protruding shortly from the ring. Fruit black, oval,  $\frac{1}{2}$  in. long.—Meissn. in *DC. Prod.* xv. i. 509.

Hab.: Endeavour River, *Banks and Sclander*; Cape Grafton, *A. Cunningham*; Rockingham Bay, *Dallachy*; and other tropical scrubs.

Wood light-coloured, close-grained, hard and tough.—*Bailey's Cat. Ql. Woods*, No. 316.

2. ***E. hypotephra*** (under side of leaf grey), *F. v. M. Fragm.* v. 166, partly; *Benth. Fl. Austr.* v. 301. A moderate sized tree, the young branches petioles and inflorescence softly ferruginous-tomentose or villous. Leaves ovate-elliptical or oval-oblong, shortly acuminate or rarely obtuse, 3 to 5 in. long, coriaceous, glabrous above with impressed veins, glaucous underneath, with the primary raised veins ferruginous-tomentose or villous. Flowers much larger than in any other species, few together in dense cymes on very short peduncles forming interrupted raceme-like panicles, usually shorter but sometimes as long as the leaves. Bracts small, but larger and more persistent than in the other species. Pedicels very short. Perianth-tube small, turbinate, the limb spreading to 3 or 4 lines diameter. Staminodia of the outer row forming a thick fleshy crenulate ring bordering the orifice of the tube and enclosing the ovary, the 3 inner stamens shortly protruding from the ring. Fruit oblong,  $\frac{3}{4}$  in. long, resting on the persistent but not enlarged perianth.

Hab.: Rockingham Bay, *Dallachy*; and many other tropical localities.

Wood hard of a grey colour.—*Bailey's Cat. Ql. Woods*, No. 316a.

3. **E. discolor** (2-colored), *Benth. Fl. Austr.* v. 301. A shrub or tall tree, the young branches and inflorescence minutely hoary-tomentose. Leaves ovate or elliptical, obtuse or shortly acuminate, 2 to 3 in. long, green and glabrous above, glaucous or white underneath, with a few prominent primary veins, the smaller reticulations conspicuous on both sides in the full grown leaf. Panicles thyrsoid, much shorter than the leaves, the pedicels very short. Perianth-tube small and turbinate, the limbs very open, about  $1\frac{1}{4}$  lines diameter, with ovate segments. Stamens of the outer row entirely deficient, of the inner series 3, with sessile glands at their base and alternating with 3 small staminodia. Fruit ovoid-oblong,  $\frac{3}{4}$  to 1 in. long, resting on the unenlarged remains of the perianth.

Hab.: Albany Islands and Cape York, *W. Hill*; Rockingham Bay, *Dallachy*; and the more southern coastal scrubs.

4. **E. Sieberi** (after F. W. Sieber), *Nees. Syst. Laurin.* 194; *Benth. Fl. Austr.* v. 301. "Till," Stradbroke Island, *Watkins*. A shrub or tree, glabrous except a minute pubescence scarcely perceptible on the inflorescence. Leaves ovate-lanceolate or oblong, obtuse or obtusely acuminate, 2 to 3 in. long, contracted into a short petiole, rather thin, green on both sides, with the smaller reticulations as prominent as the rather numerous and fine primary veins. Panicles thyrsoid, shorter than the leaves. Perianth-tube very small, the limb very open. Stamens of the outer series entirely deficient, 3 of the inner series perfect with a gland on each side at the base, the intervening staminodia very small or obsolete. Young fruit globular, resting on the apex of the peduncle, the whole perianth deciduous. Fruit oval, about 1 in. long, with somewhat the fragrance of a nutmeg.—*Meissn. in DC. Prod.* xv. i. 79.

Hab.: Islands of Moreton Bay.

Wood grey or light-brown, close in grain, suitable for tool-handles.—*Bailey's Cat. QL. Woods*, No. 317.

5. **E. virens** (green), *F. v. M.*; *Meissn. in DC. Prod.* xv. i. 509; *Benth. Fl. Austr.* v. 302. A tall shrub or tree attaining a considerable height, glabrous in all its parts. Leaves oblong usually narrow, rarely broader and elliptical, obtuse, contracted at the base, 2 to 3 in. long in some specimens, twice that size in others, not thick, green and reticulate on both sides, somewhat shining above, a few of the primary veins more prominent than the others. Panicles slender, glabrous, much shorter than the leaves. Pedicels rather long. Flowers small. Perianth-tube very thick, broadly turbinate, nearly 1 line diameter, forming a thick projecting ring round the base of the lobes which are shorter than the tube, broad and connivent, the 3 inner ones rather smaller than and quite enclosed in the outer ones. Stamens of the outer row entirely deficient, of the inner row 3, without glands at their base, but alternating with sessile staminodia. Fruit globular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, resting on thickened pedicels of  $\frac{1}{2}$  in. or more.

Hab.: Common along Creek sides in southern localities.

Wood of a grey colour, close-grained and firm; useful for many purposes.—*Bailey's Cat. QL. Woods*, No. 317A.

6. **E. Muelleri** (after Baron Mueller), *Meissn. in DC. Prod.* xv. i. 509; *Benth. Fl. Austr.* v. 302. A moderate sized tree, glabrous except a minute ferruginous tomentum on the inflorescence and sometimes on the young shoots. Leaves ovate elliptical or broadly oblong, acuminate, cuneate at the base, green on both sides, the primary veins more prominent and the reticulations less so than in *E. Sieberi*, mostly 3 to 5 in. long. Panicles axillary, loose, much shorter than the leaves. Pedicels longer than the flower. Perianth-tube thick and fleshy,

broadly turbinate,  $1\frac{1}{2}$  line diameter, the lobes small and connivent. Stamens 3, with broad flattened glands; staminodia of the outer series deficient, of the inner-series small or obsolete. Fruit not seen.

Hab.: Logan River, *Rev. B. Scortechini*.

The species is near *E. virens*, but with broader, less reticulate leaves, and the flowers twice as large. The glands in the flower of this and some other species described sometimes as staminodia appear to me to be as precisely the same as the glands of the inner stamens of so many other Laurineæ.—*Benth.*

7. ***E. pubens*** (hairy), *Meissn. in DC. Prod.* xv. i. 509; *Benth. Fl. Austr.* v. 302. A large tree, the branches and petioles more or less velvety-tomentose and ferruginous. Leaves oval to elliptical-oblong, obtusely acuminate or almost obtuse, narrowed at the base, 4 to 8 in. long, glabrous above, prominently veined and pubescent or villous underneath. Panicles axillary, broadly thyrsoid, usually about 1 in. long, sometimes more branched and half as long as the leaves, sometimes very short, more or less ferruginous-hirsute. Bracts narrow, the lower ones often 1 line long, those in the cymes smaller. Pedicels scarcely so long as the flower. Perianth nearly  $1\frac{1}{2}$  line long, the tube thick, turbinate, broader than the limb, the lobes smaller and erect. Stamens 3, usually exserted, the filaments rather narrow, without glands, but alternating with small staminodia, the outer series quite deficient. Fruit globular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter.—*Cryptocarya Muellieri*, *Meissn. l.c.* 73.

Hab.: Brisbane River, Moreton Bay. *F. v. Mueller*.

8. ***E. Cowleyana*** (after E. Cowley), *Bail. Bot. Bull.* v. 23. A scrub usually about 70 ft. in height, with a somewhat smooth bark, tree branchlets rather slender, glabrous, except the young growth. Leaves ovate-lanceolate, shortly and bluntly acuminate, 2 to  $2\frac{1}{2}$  in. long, on petioles about 3 lines long, quite glabrous, the primary nerves few and distant, the reticulation fine but prominent on both sides. Panicles terminal or in the upper axils, narrow, 2 or 3 in. long, the branchlets puberulent. Bracts hairy, lanceolate, larger than the flower, but falling very early. Perianth hairy outside, very minute, pedicellate, scarcely over a line in diameter when expanded, the 3 fertile stamens prominent, with broad ciliate filaments, staminodia also hairy, ovary glabrous.

Hab.: Scrubs near Barron River, *E. Cowley*.

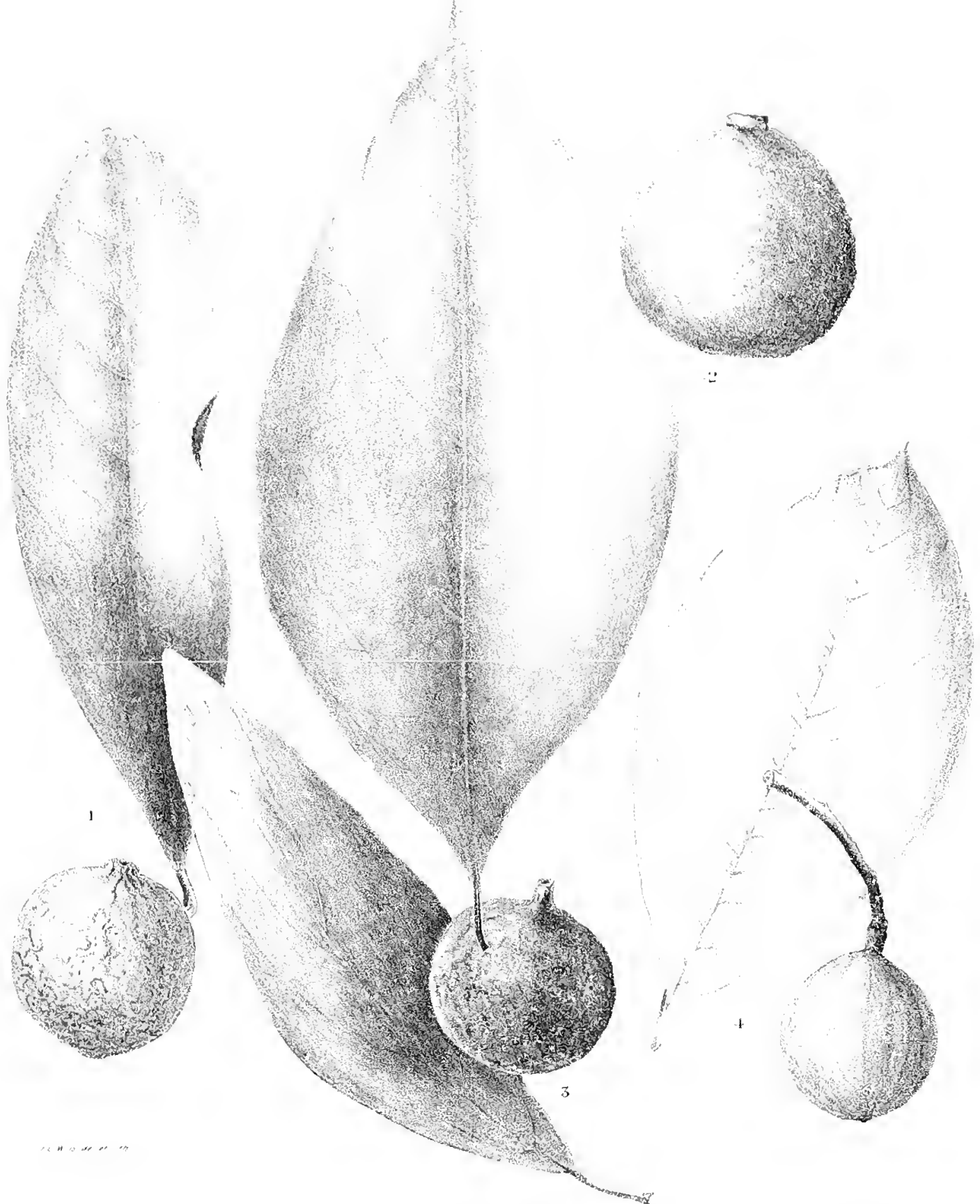
Wood of a grey colour, with a grain like cedar, light, easy to work; useful for cabinet-work.—*Bailey's Cat. Ql. Woods*, No. 317b.

9. ***E. dichrophylla*** (leaves 2-coloured), *F. v. M. Vict. Nat. May*, 1892. Upper surface dark green, under pale. A tree about 40 ft., the branchlets silky. Leaves ovate-lanceolate, or almost ovate; 2 to 5 in. long,  $1\frac{1}{2}$  to 2 in. broad, shortly acuminate. Dark green on the upper, pale on the lower surface, and there bearing a slight silkiness; rather strongly keeled; primary veins thin and devoid of conspicuous foveoles at their axils; venules reticulate; petioles rather short. Panicles usually much shorter than the leaves, axillary and terminal, slightly silky. Bracts rather conspicuous, ovate-lanceolate. Flowers very small on extremely short pedicels. Sepals somewhat larger than the petals, with these connate below the middle and persistent; filaments extremely short. Fruit, when fully developed, about 1 in. long, black, narrow, ellipsoid; pericarp very thin.

Hab.: Russell River, *Stephen Johnson*.—*F. v. M.*

10. ***E. exostemonea*** (stamens exserted), *F. v. M. Vict. Nat. June* 1892. Branchlets and petioles thinly brown-tomentose. Leaves on rather short petioles, attaining 5 in. in length and  $1\frac{3}{4}$  in. in breadth, mostly ovate-lanceolate, chartaceous, both sides shining, but slightly paler green beneath, with tomentose nerves,





# Endiandra

1 *Toorana*, *Bail*

2 *insignis*, *Bail*

3 *Lowiana*, *Bail*

4 *Sankegana*, *Bail*

the reticulation close and conspicuous. Panicles axillary and terminal, much shorter than the leaves, often numerous, the peduncle and pedicels with brown appressed hairs. Flowers very small. Calyx and petals brownish, paler towards the margin, nearly glabrous; calyx-lobes semi-ovate, somewhat longer than the petals. Stamens glabrous, with 2 lanceolate appendages at the base, thin upper portion exerted. Style rather conspicuous, as well as the ovary glabrous; stigma minute. Fruit large, globular.

Hab.: Daintree River, *Theod. Pentzke*.—F. v. M.

11. **E. Lowiana** (After the Messrs. Low, of Maroochie), *Bail. Bot. Bull.* v. 24. A small-sized glabrous tree. Leaves lanceolate, the apex sometimes somewhat elongated, 3 to 5 in. long; petiole 4 or 5 lines long, slender; primary nerves very oblique, distant, and only about 4 on each side of the costa; the reticulation fine, close, and prominent between them, on both sides of the leaf; texture thin. Flowers not seen. Fruit nearly globular, but showing more or less of a point at each end, about  $1\frac{1}{4}$  to nearly  $1\frac{1}{2}$  in. in diameter, when fresh of a rich red colour.

Hab.: Maroochie (Yandina), *J. A. Low*; Eudlo, *Field Naturalists*.

The fruit resembles that of *Cryptocarya australis*, Benth., somewhat in colour and shape, but is much larger, and the foliage is quite distinct from that of any other Australian species of the Order.

12. **E. Sankeyana** (after J. R. Sankey), *Bail. Bot. Bull.* viii. "Goolaway," Barron River, *E. Cowley*. A tree attaining the height of about 70 ft.; the young branches often 4-angular and more or less densely ferruginous velvety-tomentose. Leaves alternate or subopposite at the ends of the branchlets, from elliptical-oblong to lanceolate, the larger ones 5 in. long and  $2\frac{1}{2}$  in. broad in the widest part, shortly petiolate, the upper surface glabrous, the primary veins sunk, under surface pale, with the primary and reticulate veins very prominent, of a reddish-brown, and more or less velvety. Flowers not seen. Fruit racemes lateral or axillary, erect near the ends of the branchlets, rather slender, about  $2\frac{1}{2}$  in. long, with one or two fruit at the end. Fruit black, globose, often compressed, 1 to  $1\frac{1}{2}$  in. diameter, resting upon a star-like perianth, not exceeding 2 lines diameter.

Hab.: Scrubs about the Barron River, *E. Cowley*.

Wood of a greenish colour, hard and tough; a useful building timber.—*Bailey's Cat. Ql. Woods*, No. 317c.

13. **E. insignis** (notable), *Bail. Ql. Ag. Jl.* i. 80. "Boomban," Barron River, *J. F. Bailey*; "Koo-roong-gi", Atherton, *Ioth.* A tree of large size, the branchlets bluntly angular, and densely ferruginous-tomentose. Leaves 6 to 8 in. long, 3 to 4 in. broad, ovate, obtuse-apiculate, emarginate or shortly and bluntly acuminate, tapering at the base to a petiole of about 1 in., margins entire, upper surface glabrous, under surface more or less covered with ferruginous hairs, often very dense on the midrib, oil-dots numerous, but only visible under a strong lens, primary nerves few and distant, alternate or nearly opposite, about 5 pairs, the cross veins almost parallel and prominent. Flowers minute in slender trichotomous panicles under 2 in. long, pedicels slender, longer than the flowers. Flowers nearly globular in the bud, usually about a line long; outer segments nearly rotund, inner ones somewhat apiculate, hairy on both sides. Stamens (in the flowers examined), the 3 inner ones alone fertile. Ovary and style more or less hairy. Fruit a rich pink, glabrous, somewhat pear-shaped, about  $2\frac{1}{2}$  in. long,  $2\frac{1}{4}$  in. diameter, inclosing a pendulous globose nut  $1\frac{1}{2}$  in. diameter, which when ripe is free from the fleshy part or sarcocarp.—*Cryptocarya insignis*, *Bail. Bot. Bull.* ii. 15.

Hab.: Tropical scrubs in the Cairns district, and thence to the Bellenden-Ker Range, *Bailey, Nugent and Cowley*.

The kernel of the nut after undergoing a similar preparation to that of the Koi-ie, form a food for the natives.—*J. F. Bailey*.

14. **E. tooram** (aboriginal name), *Bail.* "Tooram," Middle Tully River, *J. F. Bailey*. Small tree. Branchlets rather slender, and more or less ferruginous-tomentose. Leaves oblong, about 4 to 5½ in. long and about 1½ in. broad, tapering to a petiole of 3 to 4 lines, upper side glabrous, underside thinly ferruginous tomentose, lateral nerves about 14 on each side of the midrib. No flowers seen. Fruit purple, borne on irregular racemose-panicles at the end of short branchlets; pedicels thickened, 2 or 3 lines long, orbicular, flattened, almost lens-shaped, 1 to 1½ in. diameter; epicarp fleshy, endocarp thin crustaceous, cotyledons very thick, plumula hairy.

Hab.: Middle Tully River, *J. F. Bailey*.

Fruit eaten by the natives.—*J. F. Bailey*.

#### 4. CINNAMOMUM, Burn.

(From the Arabic name for Cinnamon.)

Flowers usually more or less unisexual. Perianth-segments 6, equal or nearly so. Stamens of the outer series 6, all perfect with introrse anthers, of the inner series 3 perfect, with extrorse anthers, alternating with 3 short staminodia; anthers 4-celled or the inner ones rarely 2-celled; glands 6, at the base of the inner perfect stamens. Ovary not immersed. Berry seated on the somewhat enlarged truncate or 6-lobed perianth-tube, the segments wholly or partially deciduous.—Trees or shrubs. Leaves opposite or often more or less alternate on the same tree, 3-nerved or rarely 5-nerved. Flowers in axillary panicles, more or less unisexual, the females usually rather larger and fewer in the panicle with the stamens slightly imperfect, the males smaller and more numerous with a sterile ovary. The numbers of parts of the perianth and of the stamens liable to occasional variation, especially in the females.

The genus extends over tropical and subtropical Asia as far as Japan, one of the Australian species is the same as an *E. Indian* one, the two others are endemic.

Leaves lanceolate, attaining 8 in., narrow. Panicles long as the leaves.

Pedicels about 1 line long

1. *C. Oliveri*.

Leaves ovate to ovate-lanceolate, attaining 3 in. Panicles long as the leaves.

Perianth sessile

2. *C. propinquum*.

Leaves ovate lanceolate, attaining 6 or more inches, triplinerved. Panicles long as the leaves. Pedicels long as the perianth

3. *C. Tamala*.

1. **C. Oliveri** (after Prof. D. Oliver), *Bail. Bot. Bull.* v. 25; *Proc. Roy. Soc. Ql.* xi. x. 24. Sassafras. A tall tree, glabrous, except the inflorescence-trunk erect, bark containing nodules, smoothish, rather thin and fragrant. Leaves opposite or nearly so, lanceolate, attaining about 8 in. in length, and then scarcely over 1½ in. broad in the widest part, colour pale, the apex blunt or minutely emarginate, on petioles of about ½ in. which are flattened, the upper surface glossy, the under surface of lighter colour, midrib flattish, the primary lateral nerves very oblique, few, the basal pair faint, and very near the margin until lost in the reticulation about half-way up the leaf. Inflorescence terminal, or in the upper axils, in loose elongated panicles 6 to 8 in. long; flowers in twos or threes at the end of the branchlets, the pedicels about a line long. Flower velvety, cream coloured, perianth-tube slender, about 2½ lines long, the lobes equal, scarcely as long as the tube, marked by several longitudinal nerves. Stamens 9; the six outer ones about as long as the perianth-lobes, filaments flattened and hairy, the 3 inner ones short, with prominent glands upon the hairy filaments. Staminodia with sagittate heads and hairy filaments like the stamens. Style and ovary nearly or quite glabrous; stigma dilated. Berry about 4 lines long, oval, partially sunk in the slightly enlarged calyx-tube from which the lobes have fallen.

Hab.: Scrubs of North Coast Railway.



This contains a tannin similar or identical with cinchona tannin; the amount, seven and a-half per cent. One ton of the dry bark yields 770oz. of oil.—*K. T. Staiger*.

The leaves and the bark of the young branches contain  $\frac{1}{2}$  per cent of true dextrarotatory camphor, being identical with the camphor of the Camphor Laurel (*Cinnomomum camphora*).—*Lauterer*.

The leaves are at times infested with *Gloeosporium cinnamomi*, Cke. and Mass. and *Aschersonia oryzae*, Berk. and the fruit with *Melampsora Nesodaphnes*, Berk. and Br.

Wood pale-coloured, close in the grain, firm, easy to work; suitable for joiners work.—*Bailey's Cat. Ql. Woods*, No. 315.

2. **C. propinquum** (resembling another), *Bail. Bot. Bull.* v. 25. A mountain tree, the branchlets 4-angular. Leaves opposite or subopposite, ovate to ovate-lanceolate, from 1 to nearly 3in. long, on flattened petioles of 3 or 4 lines long, stoutly coriaceous, 3-nerved, the lateral ones vanishing at a little more than half-way up the leaf, the reticulation somewhat obscure; upper surface glossy, under surface whitish. Inflorescence terminal in pairs, the terminal shoot growing out from between the two panicles which are about 2½in. long including the peduncle; branches few, bearing at their ends 2 or 3 sessile flowers hoary on the outside. Perianth-tube short, angular segments 6, ovate, 2 lines long, the 3 inner ones rather smaller than the outer. Stamens shorter than the perianth. Stigma scarcely broader than the style.

Hab.: Summit of Bellenden-Ker, *Expd.* 1889, leaf specimens; Mount Bartle-Frere, *Stephen Johnstone*, (F. v. M.), flowering specimens, one of which was kindly sent to me for describing in the present work by Mr. J. G. Luehmann, Government Botanist, Victoria.

This species seems nearly allied to *C. ovalifolium*, Wight. Ic. 125, of the Ceylon Mountains.

3. **C. Tamala** (Indian name), *Th. Nees.*: *Nees. Syst. Laurin.* 56; *Benth. Fl. Austr.* v. 303. A large tree with a smooth almost white bark (*Dallachy*). Leaves opposite or here and there alternate, oblong-lanceolate or ovate-lanceolate, obtusely acuminate, acute at the base, 3 to 6in. long, triplinerved, silvery underneath when young with small closely appressed hairs, the older ones glabrous or nearly so and showing underneath the fine reticulate veinlets. Pedunculate in the uppermost axils, bearing in the Australian specimens (probably from a fertile tree) a loose panicle rather shorter or rather longer than the leaves more or less silvery pubescent. Pedicels about as long as the perianth. Perianth-tube about 1 line, the segments or lobes 2 lines long. Stamens shorter than the perianth, some or all apparently perfect but unequally so in the flowers examined. Stigma broadly peltate.—*Miq. Rev. Cinnam.* in *Ann. Mus. Lugd. Bat.* i. 268; *Meissn.* in *DC. Prod.* xv. i. 17; *Laurus Tamala*, *Hamilt.* in *Trans. Linn. Soc.* xiii. 555; *L. Cassia*, *Roxb. Fl. Ind.* ii. 297, not of *Willd.*; *Cinnamomum Laubatii*, *F. v. M. Fragm.* v. 165.

Hab.: Met with in several of the tropical scrubs.

In India the bark is said to be collected and sold under the name of "Taj," and the leaves under the name of "Tezpat, tajpat."

Wood of a grey-colour, close-grained, firm, and strongly scented.—*Bailey's Cat. Ql. Woods*, No. 318.

## 5. PERSEA, Gaertn.

(A name applied by Theophrastus to an Egyptian tree.)

Flowers hermaphrodite, or rarely by abortion polygamous. Perianth-tube short; segments 6, nearly equal or the 3 exterior smaller, seldom very small. Perfect stamens 9, in 3 series, the first and second eglandulous, the third inner series with 2 globose glands at the base; anthers introrse, 4-celled; filaments villous. Staminodia with cordate triangular heads. Ovary sessile. Stigma discoid. Berry more or less thickened and fleshy. Trees with alternate or opposite penninerved or triplinerved leaves. Flowers paniculate, axillary or sub-terminal.

1. **P. Baileyana** (After F. M. Bailey), *F. r. M. inedited 2nd. Suppl. Syn. Qt. Fl.* 51. Candle-wood of Frazer's Island. A scrub tree attaining the height of about 60ft., glabrous except the inflorescence. Leaves opposite, or here and there alternate, ovate or ovate-lanceolate, 2 or 3 inches long, on petioles of about  $\frac{1}{2}$ -inch, green on both sides, prominently triplinerved and finely reticulate, most conspicuous on the underside. Inflorescence terminal on the upper axils, forming short trichotomous panicles, or more or less racemose, bearing distant few-flowered clusters. Perianths silky-white, on short pedicels; segments about 2 lines long.

Hab.: Frazer's Island.—*H. St. John Wood*.

Wood of a dark-grey colour, close-grained and slightly fragrant.—*Bailey's Cat. Qt. Woods*, No. 319.

## 6. LITSEA, Lam.

(From the Chinese, *Litsè*, the name of *L. chinensis*).

(*Tetranthera*, Jacq.)

Flowers diœcious, umbellate; umbels 4 to 6 rarely more-flowered, sessile or pedicellate. Pedicels clustered, rarely solitary; axillary, or on the leaf-scars (lateral), sometimes racemose or fascicled on a common peduncle; involucre bracts 4 to 6, rarely more; concave, coriaceous or membranous. Perianth-tube ovoid campanulate or very short; lobes or segments 6 to 4, rarely more or less fewer, equal or unequal, or in a few wanting. Stamens 6, 9, 12, rarely more or fewer-filaments of first and second series usually eglandular, of the third (and fourth if present), 2-glandular. Anthers all introrse, 4-celled. Fruit a drupe or succulent, seated on the often greatly enlarged perianth-tube; evergreen, rarely deciduous.—Trees or shrubs. Leaves alternate, rarely opposite or subopposite, penninerved, rarely triplinerved, leaf-buds naked or scaly.

The species chiefly tropical. Australian ones mostly endemic.

SECT. I. **Eulitsea**.—*Leaves persistent, alternate, penninerved. Perianth-segments very incomplete or none, tube not or slightly enlarged in fruit. Stamens often more than 12.*

Leaves hoary-pubescent or glabrous, usually large, the reticulations not prominent. Flowers rather large . . . . . 1. *L. chinensis*.

SECT. II. **Neolitsea**.—*Leaves persistent, alternate, triplinerved, sometimes subverticillate. Umbels in sessile clusters. Perianth-segments usually 4, deciduous, tube not or rarely enlarged in fruit. Stamens usually 6. Fruit small.*

Glabrous, with the inflorescence slightly pubescent. Fruiting perianth entire (the segments deciduous) . . . . . 2. *L. zeylanica*.

More or less ferruginous-villous, at least the young shoots and inflorescence. Fruiting perianth 4-toothed (the segments wholly or partially persistent) . . . 3. *L. dealbata*.

SECT. III. **Cylicodaphne**.—*Leaves persistent, alternate, rarely opposite, penninerved. Perianth-segments usually 6, tube much enlarged, disciform or cupular in fruit.*

Leaves large broad, very obtuse, glabrous, not reticulate . . . . . 4. *L. Bindoniana*.

Leaves broad or narrow, obtuse, ferruginous underneath, not reticulate . . . 5. *L. ferruginea*.

Leaves rather thin, glabrous, conspicuously reticulate on both sides . . . 6. *L. reticulata*.

1. **L. chinensis** (of China), *Lam. Dict.* iii. 574. A small tree, the branches foliage and inflorescence more or less hoary-pubescent or the older leaves glabrous. Leaves petiolate, ovate obovate-elliptical or oblong, obtuse, shortly acuminate or rather acute, 4 to 8 inches long on the flowering branches, often larger on barren ones, green on both sides or glaucous underneath, the primary veins prominent on the underside. Peduncles 3 to 6 lines long, clustered or racemose, the common rhachis sometimes very short and usually shorter than the peduncles. Bracts of the involucre about 2 lines diameter, enclosing 5 or more sessile or very shortly pedicellate villous flowers. Perianth-segments very irregular, 1 to 6 or entirely abortive, and always very deciduous. Stamens in the Australian specimens usually 10 or 11, in some Asiatic ones more numerous; filaments filiform, hairy, 3 or 4 of the inner one with a pair of glands at the base. Fruit globular, 3 or 4

lines diameter, resting on the more or less thickened pedicel with the persistent perianth-tube somewhat enlarged but flat or slightly concave.—*Tetranthera apetalu*, Roxb. Pl. Corom ii. 26, t. 147; R. Br. Prod. 403; *T. laurifolia*, Jacq., Meissn. in DC. Prod. xv. i. 178; Benth. Fl. Austr. v. 305.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Port Denison, *Fitzalan, Dallachy*; Elliott River, *Bowman*.

Wood of a yellow colour, with a small quantity of dark-brown heart-wood, grain close. *Bailey's Cat. Ql. Woods*, No. 321.

2. ***L. zeylanica*** (of Ceylon), *Nees, frr. Cinnam. Disput. in Amæn. Bot. Bonn.* i. 58, t. 5; *Benth. Fl. Austr.* v. 307. A large tree, the branches and inflorescence quite glabrous or scarcely hoary with a very minute tomentum. Leaves ovate-elliptical or elliptical-oblong, acuminate, contracted at the base, 3 to 5 in. long, glabrous and green above, white or glaucous underneath, penniveined but with few primary veins, the lowest pair more prominent than the others. Flowers in sessile clusters in the axils or at the old nodes, on pedicels of 1 to 2 lines usually glabrous as well as the perianths. Perianth-segments ovate-oblong, obtuse. Filaments exerted, with a few hairs about the base; glands of the two inner ones stipitate. Berry globular or slightly ovoid, larger than in *L. dealbata*, resting on the persistent perianth-tube expanded into an entire or slightly angular flat disk of  $2\frac{1}{2}$  to 3 lines diameter, the segments entirely deciduous.—Meissn. in DC. Prod. xv. i. 226; Wight, Ic. t. 132 and 1844.

Hab.: Lizard Island, *Banks and Solander* (the specimens imperfect and therefore omitted by R. Brown); Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; between Cleveland and Rockingham Bays, *W. Hill*; Rockhampton, *Thozet*.

The species has a wide range over tropical Asia.

3. ***L. dealbata*** (whitened), *Nees, Syst. Laurin.* 630; *Benth. Fl. Austr.* v. 307; “Marragiddie,” Barron River, *J. F. Bailey*. A moderate-sized tree, the young shoots softly ferruginous-villous. Leaves petiolate, ovate-elliptical or almost oblong, acuminate, contracted at the base, 3 to 6 in. long, glabrous above with the primary veins slightly prominent, glaucous underneath, the primary veins more prominent and glabrous or villous, few in number and the lowest pair usually longer and thicker. Flowers in sessile clusters, axillary or at the old nodes, the pedicels thick, 1 to 2 lines long. Perianth-segments 4, lanceolate, 1 to  $1\frac{1}{2}$  line long, villous outside and the margins fringed with long ferruginous hairs. Filaments filiform, longer than the perianth, bearded with a few hairs below the middle; the staminodia in the females small and irregular. Ovary slightly hairy; stigma broad and oblique. Fruit globular, 3 to 4 lines diameter, resting on the persistent perianth-tube enlarged into a small flat disk, 4-toothed with the persistent remains of the segments.—Meissn. in DC. Prod. xv. i. 224; *Tetranthera dealbata*, R. Br. Prod. 403.

Hab.: Common both north and south.

Var. *rufa*. The rufous hairs more abundant and persistent on the branches and underside of the leaves.—Brisbane River, Moreton Bay, *Fraser, F. v. Mueller, W. Hill, Leichhardt*.—Common.

Wood of a yellowish colour, with numerous short brown longitudinal streaks; tough and close-grained.—*Bailey's Cat. Ql. Woods*, No. 320.

4. ***L. Bindoniana*** (after S. Bindon), *F. v. M. Fragm.* v. 157. A small tree, the young branches and petioles minutely ferruginous-tomentose or at length glabrous. Leaves on rather long petioles, broadly ovate obovate or orbicular, obtuse, 5 to 8 in. long, firmly coriaceous, glabrous above, glaucous or somewhat ferruginous underneath, with the primary veins much raised, the smaller transverse ones not numerous. Male flowers not seen. Female peduncles 2 to 3 lines long, in almost sessile clusters, ferruginous-pubescent as well as the bracts. Flowers 5, sessile. Perianth nearly 2 lines long, villous;

segments 6, narrow, as long as the tube. Staminodia 6, outer ones without glands, 3 inner each with a pair of glands. Ovary pubescent. Style thick, villous, with a flat spreading somewhat lobed stigma. Fruit (not seen ripe) protruding from the enlarged persistent cup-shaped truncate perianth-tube.—*Cylicodaphne Bindoniana*, F. v. M. l.c.; *Tetranthera Bindoniana*, F. v. M. Fragm. v. 167; Benth. Fl. Austr. v. 305.

Hab.: Summit of M'Alister Hill, Rockingham Bay, *Dallachy*; and other northern localities.

5. **L. ferruginea** (rusty-haired), *Benth. and Hook. Ger. Pl.* iii. 161. A tree of 80ft. or more, the branches and petioles ferruginous-pubescent or villous. Leaves from broadly ovate to elliptical-oblong, acuminate or rarely obtuse, rounded or cuneate at the base, 3 to 5in. long, rather firm, glabrous and shining above, ferruginous-pubescent underneath with raised primary veins, and transverse veinlets. Peduncles clustered in the axils or at the old nodes, 3 to 6 lines long in the males, shorter in the females. Bracts orbicular, enclosing 5 or 6 flowers on very short thick pedicels. Perianth-segments 6, lanceolate ciliate and very deciduous in the females, broader more obtuse and sometimes few in the males. Perfect stamens 2, twice as long as the perianth, the filaments hairy; staminodia in the females 12, short. Fruit (not seen quite ripe) ovoid, resting in the enlarged cup-shaped truncate perianth-tube which attains 3 to 4 lines diameter. Meissn. in DC. Prod. xv. i. 192; *Cylicodaphne Lecfana*, F. v. M. Fragm. v. 169. *Tetranthera ferruginea*, R. Br. Prod. 403; Benth. Fl. Austr. v. 305.

Hab.: Cape Grafton and Endeavour River, *Banks and Solander. A. Cunningham*; Rockingham Bay, *Dallachy*; between Cleveland and Rockingham Bays, *W. Hill*.

Wood pale yellow, light, close-grained, and easily worked.—*Bailey's Cat. Ql. Woods*, No. 321A.

Var. *lanceolata*, Meissn. Leaves oblong or oblong-lanceolate. Male flowers as in the typical form, females unknown.—*T. nesogena*, F. v. Muell. v. 169.—Family Island, Rockingham Bay, *Dallachy*; Brisbane River.

Wood of a grey colour, close-grained.—*Bailey's Cat. Ql. Woods*, No. 321B.

It seems very doubtful whether *Hexanthus* of Loureiro, from Cochin China, usually referred to *L. ferruginea*, is really the same species.—*Benth.*

6. **L. reticulata** (netted-veined), *B. and H. Gen. Pl.* Bally Gum. A tree of considerable size, glabrous except the flowers, or the young shoots minutely silky-pubescent. Leaves obovate-oblong or oblong-elliptical, obtuse or scarcely acuminate, narrowed into the petiole, mostly 3 to 4in. long, not thick, green on both sides, the primary veins not very prominent, the reticulations much more conspicuous on the upper than the lower surface. Peduncles 3 to 5 lines long in the males, much shorter in the females, usually in short irregular racemes or clusters, on a common rhachis at first very short but sometimes lengthening to  $\frac{1}{2}$ in., glabrous as well as the bracts. Perianth-segments narrow acute, silky-villous. Stamens in the males 6, outer ones rather longer than the perianth and without glands, 3 inner rather shorter, each with a pair of glands. Staminodia in the females shorter than the perianth. Ovary glabrous; stigma broad and lobed. Fruit ovoid, purple, large as a pigeon's egg, resting in the enlarged truncate cup-shaped perianth-tube.—*Cylicodaphne Farcottiana* or *Tetranthera Farcottiana*, F. v. M. Fragm. v. 168; *T. reticulata*, Meissn. DC. Prod. xv. i. 192; Benth. Fl. Austr. v. 306.

Hab.: Rockingham Bay, *Dallachy*, and many southern localities.

Wood of a grey colour, close-grained light, and easy to work. Highly prized for staves.—*Bailey's Cat. Ql. Woods*, No. 322.

## 7. CASSYTHA, Linn.

(Greek name for *Cuscuta*).

Flowers hermaphrodite (or semi-diœcious?). Perianth-segments 6, the 3 outer ones short broad and resembling the bracts, the three inner ones (when full grown) at least twice as long, almost valvate in the bud. Stamens of the outer

row 6, all perfect with introrse anthers, or rarely 3 of them (opposite the inner segments) reduced to linear or spatulate staminodia; of the inner series 3 perfect with extrorse anthers (opposite the outer perianth-segments), alternating with 3 staminodia; anthers all 2-celled; glands 6, one on each side at the base of the inner perfect stamens. Ovary free, scarcely immersed in the perianth-tube till after flowering; stigma small, obtuse or capitate. Fruit drupaceous, completely enclosed in the enlarged persistent and succulent perianth-tube, usually crowned by the small persistent segments. Seed with a membranous testa. Embryo with thick fleshy cotyledons, distinct at an early stage, but completely consolidated when ripe, assuming the appearance of a fleshy albumen at the base of which the plumula simulates an embryo.—Leafless parasites with filiform or wiry twining stems attaching themselves to living plants (usually shrubs or trees) by means of small *haustoria* (suckers). Leaves replaced by minute scales. Flowers small, sometimes very minute, in pedunculate or rarely sessile spikes, which are either reduced to close heads or elongated and interrupted, or in racemes; each flower sessile or pedicellate within a minute scale-like bract, with 2 similar bracteoles close under the perianth.

The genus is chiefly Australian and more or less maritime, and the species enumerated are all endemic, with the exception of one which extends also over the tropical regions of Africa, Asia, and America. There are besides one or two species from S. Africa, and one from Borneo.—*Benth.*

The anomalous habit of *Cassytha*, so exactly that of *Cuscuta*, has induced Lindley and others to propose it as a distinct natural Order, but the structure of the flower is so precisely that of *Cryptocarya*, that it has been again reunited with Laurineæ as a tribe. The fruit is also the same with the exception of the hard endocarp, and the cotyledons are so completely consolidated in the ripe seed, that Gærtner described them as a fleshy albumen, mistaking the plumula, which is at least as much developed as in other Laurineæ, for the embryo. R. Brown pointed out this error, and Griffith and others figured the embryo with a distinct line of separation between the two cotyledons. In the dried fruits I had at my disposal I could not detect any such demarcation, and I should have followed Gærtner in describing the seed as albuminous had it not been for Brown's very decided contradiction, more especially as Colonel Champion in some sketches made from the living plant in Hong Kong seemed to confirm Gærtner's view. On writing, however, to Dr. Thwaites in Ceylon, he has kindly examined fresh seeds, and fully corroborates Brown's and Griffith's statements, explaining the discrepancies by the circumstance that it is only at an early stage that the cotyledons are clearly distinct, the line of demarcation becoming obliterated long before maturity.—*Benth.*

In several species the specimens show two forms of flower, always on different individuals, in the one the perianth-tube is exceedingly short, in the other it is globular and as long as the segments. In both, the stamens as well as the ovary appear to be perfect, usually more advanced in the latter than in the former; but I have not as yet found any intermediate state, a circumstance which suggests a certain degree of unisexuality. Nees has generally and Meissner occasionally considered the two forms as distinct species, the one with a rotate, the other with an urceolate perianth, in which view, however, I cannot concur.—*Benth.*

Flowers sessile in a spike or head.

Flowers capitate, very small (the spikes contracted into ovoid globose or few-flowered heads).

Spikes pedunculate. Flowers few, glabrous . . . . . 1. *C. glabella*.

(The spikes of *C. pubescens*, and *C. melantha*, are sometimes capitate when in bud).

Flowers spicate, the spikes when fully out oblong or elongated, the lower or all the flowers more or less distant.

Flowers pubescent or villous. Ovary hirsute.

Spikes short, almost capitate when young. Fruiting perianth globular 2. *C. pubescens*.

Flowers glabrous or nearly so. Ovary glabrous.

Flowers 1 to 1½ line long. Spikes usually elongated, the flowers distant.

Fruiting perianth with 6 raised ribs . . . . . 3. *C. paniculata*.

Fruiting perianth smooth, the ribs scarcely visible . . . . . 4. *C. filiformis*.

Flowers 2 lines long. Spikes very short . . . . . 5. *C. melantha*.

Flowers (when fully out) pedicellate in a raceme, sometimes almost shortened into an umbel.

Stamens opposite the inner perianth-segments reduced to linear staminodia 6. *C. racemosa*.

1. **C. glabeila** (smooth), *R. Br. Prod.* 404; *Benth. Fl. Austr.* v. 309. Glabrous. Stems filiform. Spikes pedunculate, reduced to heads of 3 to 6 or rarely more very small flowers. Perianth  $\frac{3}{4}$  line long, quite glabrous as well as the bracts; in some specimens the tube undeveloped but the ovaries perfect, in others the flowers rather longer and the tube enclosing the ovary but the stamens apparently perfect. Fruit ovoid, about 2 lines long.—Meissn. in DC. *Prod.* xv. i. 254; Hook. f. *Fl. Tasm.* i. 318; F. v. M. *Pl. Vict.* ii. t. 68; *C. dispar*, Schlecht in *Linnæa*, xx. 578, Meissn. l.c. 253; *C. microcephala*, Meissn. l.c. 253; *C. casuarina*, Nees. in *Pl. Preiss.* i. 619; Meissn. l.c. 253.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*, and other southern and northern localities.

Plant used as a medicine by the natives at Mapoon.—*Roth*.

2. **C. pubescens** (pubescent) *R. Br. Prod.* 404; *Benth. Fl. Austr.* v. 310. Stems more robust than in *C. glabeila*, less so than in *C. melantha*, but variable, the young branches and inflorescence shortly pubescent or villous. Spikes short, forming when in bud close heads of few flowers, but lengthening out sometimes to  $\frac{3}{4}$  in., with the lower flowers rather distant, the peduncle always short. Flowers usually about  $1\frac{1}{4}$  line long, pubescent outside, the inner segments appearing narrower in the fruiting specimens than in those in which the tube remains undeveloped. Ovary villous. Fruiting perianth ovoid, pubescent, about 2 lines long.—Schlecht. *Linnæa*, xx. 577; Meissn. in DC. *Prod.* xv. i. 255; Hook. f. *Fl. Tasm.* i. 318; *C. piligera*, Schlecht. *Linnæa*, xxi. 446; *C. tasmanica*, Meissn. l.c. 252; *C. rugulosa*, Meissn. l.c. 255.

Hab.: Hervey Bay and Sandy Cape, *R. Brown*, and other southern and northern localities.

3. **C. paniculata** (paniculate), *R. Br. Prod.* 404; *Benth. Fl. Austr.* v. 311. Quite glabrous or with a scarcely perceptible pubescence on the inflorescence. Spikes pedunculate, elongated and sometimes branched, the flowers usually smaller and more distant than those of *C. filiformis*, but sometimes difficult to distinguish from them. Perianth quite glabrous or rarely with a few hairs. Fruiting-perianth globular, with 6 raised longitudinal ribs.—Meissn. in DC. *Prod.* xv. i. 256; *C. glabella*, Sieb. *Pl. Exs.*, not of *R. Br.*

Hab.: Moreton Island, *F. v. Mueller*, and many other localities.

Var. *remotiflora*. Inflorescence very slightly pubescent.—*C. remotiflora*, *F. v. Muell.*: Meissn. in DC. *Prod.* xv. i. 256.—Islands of Moreton Bay.

4. **C. filiformis** (thread-like), *Linn.*; Meissn. in DC. *Prod.* xv. i. 255; *Benth. Fl. Austr.* v. 311. Glabrous or the young shoots and inflorescence slightly pubescent. Spikes interrupted,  $\frac{1}{2}$  to nearly 2 in. long, the flowers all distant and sessile or nearly so. Perianth 1 to  $1\frac{1}{2}$  line long, glabrous except short cilia on the margins of the outer segments, the inner ones broad, the 3 outer stamens opposite the outer segments (as in most species) much broader than those opposite the inner ones, but all perfect. Ovary glabrous. Fruiting perianth globular,  $2\frac{1}{2}$  to 3 lines diameter, smooth, without prominent ribs.—*C. guineensis*, Schum.; Meissn. in DC. *Prod.* xv. i. 255; *C. americana*, Nees.; Meissn. l.c.

Hab.: Albany Island, Howick's Group, and between Dawson and Burnett Rivers, *F. v. Mueller*; Rockhampton, *O'Shanesy*, *Bowman*; Enoggera Gap, *F. M. Bailey*.

The species is widely spread over tropical Asia, Africa, and America, chiefly in maritime districts.

5. **C. melantha** (flowers black), *R. Br. Prod.* 404; *Benth. Fl. Austr.* v. 311. Stems glabrous, stouter and flowers larger than in any other species. Spikes very short and shortly pedunculate, sometimes almost reduced to heads especially when in bud and few-flowered, the fruiting rhachis varying from 3 to 6 lines long, the flowers sessile. Perianth about 2 lines long, pubescent, with short appressed hairs or nearly glabrous. Fruiting perianth ovoid-globular, 3 to

4 lines long, the whole plant especially the flowers usually drying very black.—Meissn. in DC. Prod. xv. i. 254; Hook. f. Fl. Tasm. i. 317; *C. robusta*, Meissn. l.c. 255.

Hab.: Recorded far Queensland by F. v. M. without locality,

6. **C. racemosa** (flowers in racemes), Nees. in Pl. Preiss. i. 621; Benth. Fl. Austr. v. 312. Glabrous in the typical form, with slender stems. Spikes or racemes pedunculate with few flowers, sometimes crowded at the end of the peduncle, more frequently distant, pedicellate or rarely nearly sessile, small and glabrous. Perianth under 1 line long. Three stamens of the outer row, those opposite the inner perianth segments, reduced to linear staminodia, nearly as long as the perfect stamens and sometimes slightly dilated above the middle, but always without anther-cells, the other stamens as in the rest of the genus. Fruiting perianth globular, ovoid or obovoid, obscurely 6-ribbed, about 2 lines diameter.—Meissn. in DC. Prod. xv. i. 257; *C. Muelleri*, Meissn. l.c. 257; *C. digitata*, Nees. in Pl. Preiss i. 620; Meissn. l.c. 257.

Hab.: Moreton Island, F. v. Mueller.

When the pedicels are very short, *C. racemosa* might be mistaken for *C. glabella*, but it is always readily distinguished in all its forms by the staminodia instead of stamens opposite the inner perianth-segments, which I have not observed in any other species.—Benth.

## 8. HERNANDIA, Linn.

(After F. Hernandez, M.D.)

Flowers monœcious. Perianth-segments in two rows, valvate in each row in the bud, 3 or 4 in each row in the males and 4 or 5 in the females. Male fl. Stamens as many as the outer perianth-segments and opposite to them, with a gland on each side at the base (or in species not Australian on one side only or none); anthers 2-celled, introrse, the valves separating laterally from the inner to the outer edge. Female fl. inserted in a cup-shaped or lobed involucre. Glands or staminodia as many as outer perianth-segments and opposite to them. Ovary inferior, fleshy; style short, thick, with a dilated irregularly toothed or lobed stigma. Fruit somewhat fleshy or coriaceous, indehiscent, enclosed in the enlarged fleshy or thickly membranous involucre. Seed globular; testa thick and hard, without albumen. Embryo with thick fleshy deeply-lobed cotyledons.—Trees. Leaves alternate, peltate or palmately nerved. Flowers in loose panicles on lateral peduncles at the ends of the branches, each branch of the panicle terminating in an involucre of 4 or 5 verticillate bracts enclosing 3 flowers, the central one female, sessile within the cup-shaped involucre, the 2 lateral ones males and pedicellate.

The genus contains but few species, chiefly maritime, extending over the tropical regions of the New as well as the Old World. Of the two Australian species one has a considerable range in the Old World, the other appears to be endemic.

Leaves peltate. Involucre of the female flowers and fruits entire, truncate.

Male flowers 3-merous, females 4-merous . . . . . 1. *H. peltata*.

Leaves not peltate, except on young plants. Involucre of the female flowers and fruit deeply 2-valved. Male flowers 4-merous, females 5 merous . . . 2. *H. bivalvis*.

1. **H. peltata** (peltate), Meissn. in DC. Prod. xv. i. 263; Benth. Fl. Austr. v. 314. A large tree with a spreading head, glabrous or the inflorescence very slightly hoary-tomentose. Leaves on long petioles, broadly ovate, acuminate, peltately attached near the base, 5- to 9-nerved and remotely penniveined, the larger ones nearly 1 ft. long, the upper ones much smaller. Panicles shorter than the leaves, the flowers almost clustered on the branches, one terminal female between two males within a whorl of 4 bracts, and sometimes one or two males.

lower down with a small bract under each pedicel. Male perianth slightly pubescent, the segments 3 in each row, almost petal-like, veined, about 2 lines long. Stamens 3, shorter than the segments with short filaments. Female flowers with a cup-shaped entire truncate involucre a little below the ovary and  $1\frac{1}{2}$  line long at the time of flowering, but soon enlarged and growing over the ovary or perianth-tube. Perianth-tube from the first completely adnate to the fleshy ovary, segments 4 in each row, the outer ones ovate 2 lines long, the inner ones narrow. Glands 4, large and nearly globular. Style villous, thickened upwards, with a dilated oblique irregularly lobed glabrous stigma, the whole style deciduous with the perianth-lobes. Fruit completely enclosed in the involucre which has become inflated globular, smooth and fleshy, above  $1\frac{1}{2}$  in. diameter with a circular entire orifice of about  $\frac{1}{2}$  in. diameter. Fruit about 1 in. diameter, more or less distinctly marked with 8 broad raised longitudinal ribs, with a raised terminal umbo. Seed very hard, about  $\frac{3}{4}$  in. diameter. Embryo divided into 4 or 5 thick fleshy ruminant lobes.—Seem. Fl. Vit. 205, t. 32.

Hab.: Frankland Islands, *M'Gillivray*; Dunk Island, *Dallachy*; and a few other tropical localities.

The species extends over the sea coasts of the South Pacific and Eastern Archipelago, westward to the Mascarene Islands and northward to the Philippine Islands and Loo Choo.

2. **H. bivalvis** (2-valved), *Benth. Fl. Austr.* v. 314; Cudgerie or Grease-nut. Leaves on long petioles, ovate or ovate-lanceolate, acuminate, rounded or slightly cordate at the base peltate on young plants only, 3- or rarely 5-nerved, 4 to 6 in. long. Inflorescence of *H. peltata*, the involucre of 4 or 5 bracts, the central female flowers sessile, the two lateral male ones on short pedicels articulate below the middle. Involucre of 2 distinct broad concave bracts enclosing the perianth-tube or ovary. Perianth-segments usually 8 in the males, 10 in the females, about 3 lines long, in 2 rows (one of the inner rows deficient in one flower examined). Stamens 4, the filaments slender, with 2 glands. Style slender, glabrous, with a broad crenate stigma. Involucre enclosing the fruit nearly 2 in. long, very broad, cordate at the base, much inflated, when fresh red and almost fleshy, of an almost membranous texture when dry and reticulate, divided nearly to the base into 2 valves. Fruit black, about 10-ribbed, with a very small terminal umbo. Seed as in *H. peltata*.

Hab.: Brisbane River, *Fraser*; Wide Bay, *Bidwill*; Moreton Bay, Brisbane River scrubs.

The shells of the fruit of this tree contain a dye, soluble in soda, but not in ether, alcohol or water. The kernel contains 64.8 per cent. of oil, which is similar to common laurel oil, is of the same consistency, and also the same stearine and narcotic smell.—*K. T. Staiger*.

Wood of a dark-grey colour, grain close, light and soft; suitable for carriage-brakes, lining-boards, and similar uses.—*Bailey's Cut. Ql. Woods*, No. 324.

## ORDER CXI. PROTEACEÆ.

Flowers hermaphrodite or rarely partially unisexual. Perianth regular or irregular, deciduous, consisting of 4 segments valvately united in the bud, the claws forming a tube cylindrical or dilated towards the base, the laminae short, forming a globular ovoid or rarely elongated limb; the segments at length separating either from the base upwards or revolute from the laminae downwards, leaving a portion of the tube entire or open on one side, the laminae sometimes cohering long after the segments have separated lower down. Stamens 4, opposite the perianth-segments and usually inserted on them, either with the filaments wholly adnate leaving the anthers sessile at the base of the laminae, or the filaments shortly free below the laminae, or very rarely the stamens entirely free from the perianth; anthers various all perfect or rarely partially abortive, most frequently with 2 parallel cells adnate to a connectivum continuous with the filament. Hypogynous or perigynous glands or scales in many genera 4, alternating with the stamens,



but in some genera variously united or reduced in number or wholly deficient. Ovary 1-celled, sessile or stipitate, more or less excentric, with a single terminal undivided style, variously shaped at the end, with a small terminal oblique or lateral stigma. Ovules either solitary, or 2 collaterally attached or slightly superposed, or several imbricate in 2 contiguous rows, either pendulous and orthotropous, or more frequently laterally attached and more or less amphitropous, rarely erect and anatropous, the micropyle always inferior and frequently prominent from the incomplete development of the primine. Fruit either an indehiscent nut or drupe, or a more or less dehiscent coriaceous or woody follicle, very rarely a completely 2-valved capsule; either 1-celled and 1-seeded, or when 2 seeds are ripened in a drupe sometimes really 2-celled from the growth of the endocarp between as well as round the seeds, or when 2 or more seeds ripen in a follicle, apparently 2 or more celled by the consolidation of the external coating of the 2 adjoining seeds into a membranous or woody plate detaching itself from the remainder of the seed. Seeds without albumen, the testa usually thin, rarely coriaceous or hard; embryo straight, with fleshy cotyledons and a short inferior radicle.—Shrubs or trees, rarely undershrubs or even perennial herbs. Leaves alternate or scattered, in a very few genera strictly opposite or verticillate, but often crowded under the inflorescence so as to appear verticillate, usually coriaceous, often vertical with stomata on both side, or in the same genera horizontal or narrow and terete, either toothed or variously divided, without stipules. Flowers axillary or terminal, solitary or in racemes or spikes, often condensed into umbels heads or cones, each flower or pair of flowers subtended by a bract, very deciduous in some genera and perhaps sometimes really deficient, the pedicels always without bracteoles.

Proteaceæ, with their chief seat in Australia and South Africa, extend on the one hand to New Caledonia, the Indian Archipelago, and tropical Asia, chiefly eastern, to Japan, and on the other to South America.

The clavate fusiform or disk-shaped end of the style in Proteaceæ is usually described as the stigma, and where it is more or less constricted it is said to be articulate, but I have never found any real articulation, and although the thickened style-end may be an essential aid in the collection or desimination of the pollen, its surface is not stigmatic, the real stigma being usually very small, either on the point terminating the style-end, or in the centre of the disk, or quite lateral. The diversified mode in which the different genera the conformation of this style-end and its relation to the anthers promotes the dissemination of pollen whilst it impedes self-fertilization, upon which I have drawn up a few notes from the Linnean Society founded on the examination of dried specimens, would be an interesting study for local botanists who have the means of examining and watching the plants living in their native stations.—*Benth.*

In the distribution of the numerous species of this most natural Order into tribes, genera, and sections, I have only had to follow, with slight modifications, the admirable arrangement proposed by Brown and further developed by Endlicher and Meissner; but in the great subdivision into Nucamentaceæ and Folliculares, these terms must not be taken strictly in their literal sense, for indehiscent drupes occur in both divisions. Taking, however, the fruit generally, in conjunction with the arrangement of the ovules and the inflorescence, neither of them again strictly constant, we have very fairly definite characters for two large groups which are both natural and to a certain degree geographical. For although both are abundant in Australia, the Nucamentaceæ alone are in Africa, and the Folliculares alone in Asia and America.—*Benth.*

**SERIES 1. Nucamentaceæ.**—Fruit an indehiscent nut or drupe. Flowers usually solitary within each bract.

**TRIBE I. Proteæ.**—Anthers all perfect or very rarely the upper one abortive, with 2 parallel cells adnate to the connectivum, inserted at the base of the short spreading laminae of the perianth. Ovule 1 or rarely 2. Stigma terminal. Fruit a dry nut.

Flowers in dense cone-like spikes or heads with imbricate scale-like bracts, with few or many outer empty bracts forming an involucre. Anthers free.

Cone-scales firmly adhering to the rhachis and opening for the emission of the more or less flattened nuts . . . . .

1. PETROPHILA.

Cone-scales either very deciduous or remaining closely imbricate after flowering till they fall off with the nuts which are not flattened . . . . .

2. ISOPOGON.

TRIBE II. **Conospermææ**. *Anthers: one with 2 perfect cells, two with 1 perfect and 1 abortive cell, the fourth abortive, the perfect cells broad, concave, erect, without any connective, the adjoining ones of distinct anthers applied face to face in the bud forming a single cell, all on very short thick filaments at the base of the laminae or at the summit of the tube of the perianth.* Ovule 1. Fruit a dry nut.

Lower anther abortive. Stigma raised above the stamens on the beak-like end of the style. Nut turbinate, flat and comose on the top. Leaves entire . . . . . 3. CONOSPERMUM.

TRIBE III. **Persooniææ**.—*Anthers all perfect, with parallel cells adnate to the connective, the stamens inserted at or below the middle of the perianth-segments.* Ovules 2 or sometimes 1. Fruit a drupe or rarely a dry nut or membranous.

Leaves entire. Flowers axillary or rarely forming a terminal or infra-terminal raceme by the abortion of the floral leaves. Ovules 2 or 1. Fruit a drupe . . . . . 4. PERSOONIA.

SERIES 2. **Folliculares**.—*Fruit dehiscent, follicular or 2-valved, drupaceous and indehiscent. Flowers usually in pairs, with a single bract to each pair, rarely (in Carnarvonia, Lambertia and Stenocarpus), the inflorescence anomalous.*

TRIBE IV. **Grevilleææ**.—*Ovules 2 or 4, collateral. Seeds without any intervening substances or separated by a thin lamina or mealy substance. Flowers in racemes or clusters, with deciduous or abortive bracts, or with an involucre of imbricate bracts.*

Ovules 2. Perianth regular or nearly so, small, sometimes under  $\frac{1}{2}$  in., the anthers on short filaments attached below the laminae. Style cylindrical or more or less clavate at the end.

Flowers pedicellate, in pairs, in racemes. Fruit with a fleshy indehiscent exocarp and cartilaginous endocarp . . . . . 5. HELICIA.

Flowers in racemes or panicles. Fruit with a more or less coriaceous 2-valved exocarp and horny endocarp . . . . . 6. MACADAMIA.

Flowers sessile, in pairs, in cylindrical spikes. Fruit thick and woody, tardily dehiscent. Leaves opposite . . . . . 7. XYLOMELUM.

Flowers sessile or nearly so, in pairs, in cylindrical or oblong spikes. Fruit a follicle. Leaves alternate . . . . . 8. ORITES.

Ovules 2. Perianth straight. Anthers short and sessile with the concave laminae. Leaves alternate.

Ovules orthotropous, pendulous. Fruit indehiscent . . . . . 9. KERMADECIA.

Fruit indehiscent, seeds solitary oval-globose . . . . . 10. HICKSBEACHIA.

Flowers solitary or in twos or threes, axillary. Perianth-tube almost straight, the laminae soon free. Follicle 1-seeded . . . . . 11. STRANGEA.

Ovules amphitropous, laterally attached. Fruit a follicle.

Seeds without wings or the wings short at both ends or annular. Inflorescence terminal, rarely also axillary . . . . . 12. GREVILLEA.

Seeds winged, chiefly or entirely at the upper end. Inflorescence axillary . . . . . 13. HAKEA.

Ovules 4, collateral. Perianth revolute in the bud or straight and regular. Anthers short and sessile within the concave laminae. Fruit a follicle. Leaves alternate.

Flowers solitary or clustered on irregularly branched peduncles. Fruit a follicle. Leaves alternate, compound . . . . . 14. CARNARVONIA.

Perianth revolute in the bud. Hypogynous gland unilateral or semi-annular. Follicle short and broad . . . . . 15. BUCKINGHAMIA.

Perianth straight. Hypogynous glands 4. Follicle oblong, recurved . . . . . 16. DARLINGIA.

TRIBE V. **Embothriææ**.—*Ovules several, imbricate in 2 rows. Seeds usually separated by thin laminae or a mealy substance.*

Flowers in spikes often clustered. Hypogynous glands usually 3, distant, attenuated upwards. Exocarp almost woody . . . . . 17. MUSGRAVEA.

Flowers in long pendulous racemes, and lateral, or shorter erect and nearly terminal. Hypogynous glands 4, roundish, somewhat connate . . . . . 18. HOLLANDÆA.

Hypogynous glands 4. Ovules imbricate downwards. Seeds with narrow wings all round . . . . . 19. CARDWELLIA.

Flowers in umbels without bracts . . . . . 20. STENOCARPUS.

Flowers in loose racemes or umbels. Bracts small or deciduous or wanting. Hypogynous glands 3. Ovules imbricate upwards. Seeds winged at the upper end . . . . . 21. LOMATIA.

Flowers in dense racemes; follicles oblong coriaceous. Seeds in 2-series with an oblong terminal wing . . . . . 22. EMBOTHRIMUM.

TRIBE VI. **Banksiææ**.—*Ovules 2, collateral. Seeds separated either by a hard usually woody substance or by a membrane rarely wanting. Flowers in dense cones or heads.*

Flowers in ovoid or cylindrical cones, without any involucre . . . . . 23. BANKSIA.

## 1. PETROPHILA, R. Br.

(From being found in rocky places.)

Flowers hermaphrodite. Perianth regular, the tube slender, separating into 4 segments from the base or (in two sections) remaining united, the limb of 4 linear laminæ. Anthers all perfect and free, sessile at the base of the laminæ, usually linear, the connective produced into a small appendage. No hypogynous scales. Ovary sessile, with a single or very rarely 2 collateral ovules, pendulous from near the apex of the cavity, and orthotropous or slightly amphitropous. Style filiform, either dilated and truncate towards the end under a slender or continuous and fusiform *brush*, always glabrous below the brush, the brush usually shortly hispid or papillose, at least before the expansion of the flower, with a glabrous tip and terminal stigma. Fruit a small dry and indehiscent nut, usually compressed, sometimes winged with a coma of long hairs on the margins or from the base only or also on one very rarely on both faces.—Shrubs with rigid entire or divided leaves, terete or if flat usually narrow. Flowers usually white or yellow, in dense spikes or *cones*, each flower sessile within a bract or scale; the cones globular ovoid oblong or rarely cylindrical, terminal or rarely axillary, the receptacle or rhachis woolly and usually cylindrical, the scales broad and hardened after flowering, persistent, at least at the base, and imbricate but not so closely so as in *Isopogon*, opening for the emission of the fruit, the thinner points of the scales often falling off after flowering. At the base of the cone are also several imbricate empty bracts forming an involucre sometimes larger than the scales and concealing them, usually smaller, persistent or deciduous. In several species new leaves and shoots form in the axils of the innermost of these empty bracts, which ultimately fall away, leaving the old cones sessile in the forks of the branches without empty outer bracts. Nuts usually shorter than the scales, the points rarely but the coma frequently protruding.

The genus is limited to extratropical Australia and is chiefly Western. Like the closely allied *Isopogon*, it differs chiefly from the South African genera of the same tribe in the absence of hypogynous scales. The part of the style which is here termed the brush, is usually considered as an upper article of the stigma, but I have never observed any real articulation separating it from the rest of the style, and it does not appear to be ever stigmatic except at the point.—*Benth.*

SECT. 5. **Petrophyle**.—*Leaves divided or rarely simple, the segments usually terete. Cones terminal or also axillary. Perianth-segments falling off separately. Style continuous, fusiform.*

Leaves more than 1½ in. long, segments terete, usually 2 or 3 at the end of the branches, often axillary when old.

Cones pedunculate. Perianth glabrous . . . . . 1. *P. pedunculata*.

Cones pedunculate. Perianth silky-villous . . . . . 2. *P. Shirleyæ*.

Cones sessile. Perianth silky-villous.

Foliage glabrous. Cones oblong . . . . . 3. *P. pulchella*.

Young shoots silky or hoary. Cones ovoid . . . . . 4. *P. sessilis*.

1. ***P. pedunculata*** (pedunculate), R. Br. in *Trans. Linn. Soc.* x. 70, *Prod.* 364; *Benth. Fl. Austr.* v. 332. A tall glabrous shrub. Leaves pinnate with much divided 2-3-chotomous pinnæ, the ultimate segments numerous, rather fine, rigid but not pungent, terete and grooved above. Cones axillary, ovoid or oblong,  $\frac{3}{4}$  to 1 in. long, on peduncles of  $\frac{1}{4}$  to  $\frac{1}{2}$  in. with small empty bracts at the base of the peduncle. Cone-scales glabrous, broad, hard, with a short persistent erect point. Perianth glabrous, about 5 lines long, the segments falling off separately. Style-end continuous, fusiform, angular, minutely pubescent or glabrous. Nut broad, the margins comose, both faces glabrous. Meissn. in DC. *Prod.* xiv. 269; Guillem.  *Ic. Pl. Austral.* t. 18.

Hab.: Southern coastal localities, *Rev. B. Scortechini*.

2. **P. Shirleyæ** (after Mrs. J. Shirley), *Bail. Bot. Bull.* ii. 17. A shrub of about 5 or 6ft., branches with a much wrinkled or sulcate purplish-red bark, often glossy. Leaves pinnate with 2-3-chotomous pinnæ, the segments rather slender, terete and grooved above, and the points more or less pungent, the petioles nearly of equal length with the divided portion, whole leaf from 4 to 6½ in. long. Cones terminal, solitary, or with 1 or 2 axillary ones close below it conical-oblong, 1½ to 3 in. long, ¾ to 1 in. diameter at the base; peduncles 1 to 1½ in. long, bearing 4 or 5 distant broad-acuminate bracts. Cone-scales much broader than long, more or less silky at length nearly glabrous, the elongated points deciduous above the base leaving an apiculate point to the scale. Perianth silky, yellowish, about 5 lines long; segments with glabrous points, falling off separately. Style-end continuous, fusiform, shortly hirsute. Nut slightly over 1 line broad, the apex or a little way down glabrous, the rest clothed with spreading silky white hairs.

Hab.: Moreton Island, *J. Shirley* (in flower and fruit); Fraser Island, *H. Tryon* (in fruit only).

3. **P. pulchella** (beautiful), *R. Br. in Trans. Linn. Soc.* x. 69; *Prod.* 364; *Benth. Fl. Austr.* v. 332. A shrub of 6 to 8ft., glabrous as well as the foliage or minutely pubescent when young. Leaves twice or thrice pinnate, the segments numerous, not spreading, terete, grooved above, rather slender and not pungent, the whole leaf 1½ to 2½ in. long, the petiole as long as the divided part. Cones terminal, sessile, solitary or with one or two axillary ones close below it, oblong or cylindrical 1 to 1½ in. long, and ½ to ¾ in. diameter without the perianths. Outer bracts few and small. Cones-scales broad, the outer ones very shortly acuminate and pubescent, the inner more silky at the base with lanceolate-deciduous points, all at length broad hard and glabrous. Perianth silky-pubescent, 6 to 7 lines long, the segments falling off separately. Style-end continuous, narrow-fusiform, sparingly and shortly hirsute. Nut broad, copiously comose on the margins, more sparingly hirsute on the inner face, glabrous on the back.—*Meissn. in DC. Prod.* xiv. 270; *Protea pulchella*, *Schrad. Sert. Hannov.* 15, t. 7; *Cav. Ic.* t. 550; *Bot. Mag.* t. 796; *Protea fucifolia*, *Salisb. Prod.* 48; *Petrophila fucifolia*, *Knight. Prot.* 92; *Protea dichotoma*, *Cav. Ic.* vi. 34, t. 551.

Hab.: Stanthorpe.

4. **P. sessilis** (sessile), *Sieb. in. Roem. and Schult. Syst. Veg.* iii. Mant. 262; *Benth. Fl. Austr.* v. 332. A shrub attaining 8 to 12ft., closely allied to *P. pulchella*, and as suggested by R. Brown, perhaps a variety with a more rigid foliage, the segments divaricate and the young shoots hoary-tomentose or almost silky. Cones rather broader and shorter. Perianths and style and nuts the same.—*R. Br. Prot.* Nov. 6; *Meissn. in DC. Prod.* xiv. 270; *P. canescens*, *A. Cunn. in R. Br. Prot.* Nov. 6; *Meissn. l.c.* 270.

Hab.: Moreton Bay, *A. Cunningham*, *Fraser*; Gladfield, *C. J. Gwyther*.

## 2. ISOPOGON, R. Br.

(From *isos*, equal, and *pogon*, a beard; referring to the beard-like fringes on the inflorescence).

Flowers hermaphrodite. Perianth regular, the tube slender, the upper portion falling off entire with the 4 linear or oblong segments of the limb, leaving a persistent base which finally splits or is cast off as the fruit ripens. Anthers all perfect and free, sessile within the segments of the limb, the connective tipped with a small appendage. No hypogynous scales. Ovary sessile, with a single orthotropous or slightly amphitropous ovule, pendulous from near the apex of the cavity. Style filiform, usually more or less dilated or clavate towards the end,



F. C. Wills

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*Petrophila Shirleyae*, Bail.

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and separated from the narrow often bulbous-based brush by a short neck or constriction, the clavate portion usually papillose-pubescent, rarely the style-end continuous and slender, the stigma terminal. Fruit a small dry and indehiscent nut, usually ovoid-conical, scarcely compressed and not winged, hirsute all over, the lower hairs or nearly all forming a long coma.—Shrubs with the habit of *Petrophila*. Leaves rigid, entire or divided, terete or flat and sometimes broad. Flowers yellow, pink or lilac, in dense spikes or *cones*, each flower sessile within a bract or *scale*, the cones hemispherical globular or ovoid, terminal or rarely axillary, the receptacle or rachis, woolly, flat convex conical or cylindrical, the scales tomentose or villous outside, glabrous inside, imbricate, deciduous after flowering or if long persistent and retaining the seed, readily detached and always falling off with the seed, or in a few species leaving a very short persistent base. At the base of the cone are also, as in *Petrophila*, several imbricate empty bracts, forming an involucre, larger or smaller than the cone-scales and usually more persistent, the cones are also almost always closely surrounded by floral leaves. Nuts shorter than the cone-scales, and very little varied in the whole genus.

The genus is limited to extratropical Australia, and is chiefly Western. Although the majority of the species differ from *Petrophila* in the mode of breaking up the perianth, in the form of the style-end, and in the shape and indumentum of the nut, all these characters have exceptions, and perhaps the most constant one is that of the cone-scales, which in *Petrophila* remain firmly attached to the receptacle, opening spontaneously or by force for the emission of the nuts, whilst in *Isopogon* they separate from the receptacle either with the nuts or previously.—*Benth.*

SECT. I. **Eustrobilus.**—Cone-scales all with broad dilated or truncate ends, closely imbricate after flowering in an areolated globular or ovoid mass, often long, persistent, but breaking up when the fruit fall. Receptacle convex, conical, or cylindrical.

Perianth glabrous or with a tuft of hairs at the end of the segments.

Leaves much divided, with flat, pungent-pointed segments. Flowers yellow. Outer bracts shorter than the cone-scales.

Petioles 2 to 3 in. long. Perianth about 4 lines . . . . . 1. *I. petiolaris*.

Petioles 1 to 1½ in. long. Perianth 5 or 6 lines . . . . . 2. *I. anemonifolius*.

1. ***I. petiolaris*** (stalked), *A. Cunn. in R. Br. Prot. Nor.* 8; *Benth. Fl. Austr. v.* 347. A low bushy or procumbent shrub, nearly allied to *I. anemonifolius*, the young shoots tomentose-pubescent, the adult foliage sometimes glabrous. Leaves flat and ternately or pinnately divided as in *I. anemonifolius*, but more rigid and striate. the petioles usually 2 to 3 in. long, the segments divaricate, often pungent-pointed. Cones globular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter without the perianths, or from  $\frac{3}{4}$  to 1 in. when in fruit. Outer bracts few, rather broad, acuminate. Cone-scales broadly cuneate, very woolly outside, but with longer points than in *I. anemonifolius*. Perianth scarcely 4 lines long, glabrous except the small terminal tufts, the tube short. Styles of *I. anemonifolius*.—*Meissn. in DC. Prod. xiv.* 279.

Hab.: North of Macintyre's Brook, *A. Cunningham*; *Stanthorpe*.

2. ***I. anemonifolius*** (Anemone-leaved), *Knight. Prot.* 93; *Benth. Fl. Austr. v.* 347. A shrub of 4 to 6 ft., glabrous except the cones or the branches and young shoots pubescent. Leaves on rather long petioles, once or twice trifid or pinately divided, with linear or linear-cuneate entire or 2- or 3-lobed segments, usually diverging or falcate, mostly pungent-pointed, rather rigid, and obscurely veined, the whole leaf 2 to 4 in. long and nearly as broad. Cones sessile, solitary or in clusters of 2 or 3 at the ends of the branches, nearly globular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter. Outer bracts numerous but mostly small and narrow. Cone-scales very numerous, woolly outside, the expanded truncate imbricate ends becoming glabrous with very minute points. Perianth yellow, 5 to 6 lines, glabrous except the terminal tufts of short hairs. Style-end clavate, minutely papillose-pubescent, separated by a short constriction from the bulbous base of the nearly glabrous brush.

Receptacle oblong or cylindrical.—R. Br. in Trans. Linn. Soc. x. 72, Prod. 366; Meissn. in DC. Prod. xiv. 279; F. v. M. Fragm. vi. 238; Lodd. Bot. Cab. t. 1337; *Protea anemonifolia*, Salisb. Prod. 48; Bot. Mag. t. 697; Andr. Bot. Rep. t. 332; *P. tridactylites*, Cav. Ic. vi. 33, t. 548.

Hab.: Wallangarra.

### 3. CONOSPERMUM, Sm.

(Conical seed.)

Flowers hermaphrodite. Perianth-tube straight, entire; limb of 4 nearly equal spreading lobes or 2-lipped, the upper lip very broad, concave, shortly acuminate or with recurved margins, the lower with 3 narrow lobes. Stamens inserted in the gibbous apex of the tube or concave base of the limb; filaments short, thick; anther of the uppermost stamen with 2 perfect cells, of the lateral stamens with 1 perfect and 1 abortive cells, of the lowest stamen with 2 abortive cells, the perfect cells stipitate erect concave, each one of the lateral anthers when in bud facing the adjoining one of the upper anther and forming with it but one cell, but separating as the flower opens, the abortive cells usually subulate. Ovary obconical, crowned by a tuft of long hairs, 1-celled with 1 pendulous orthotropous ovule. Style filiform at the base, more or less thickened and curved on a level with the anthers and terminating in an oblong and narrow beak with a lateral stigma close to the end elastically turned down towards the lower lobe of the perianth as the limb expands. Fruit a small indehiscent turbinate or obconical nut, the apex broad flat or concave, covered with a coma of usually long hairs, the sides villous with shorter hairs.—Shrubs or undershrubs. Leaves quite entire. Flowers blue, lilac, pink or white (not yellow), in short dense spikes, which are either sessile in dense compound heads, or solitary on axillary peduncles or varicously paniculate on axillary or terminal peduncles, each flower sessile within a broad sheathing persistent bract, the rachis of the spike often somewhat lengthened and thickened as the flowering advances.

The genus is limited to Australia, and the greater number of species to extratropical W. Australia.

SECT. 1. **Euconospermum**.—Perianth-limb 2-lipped, as long as or shorter than the tube, the upper lip very broad, concave over the anthers, the lower with 3 narrow lobes.

Stems leafy to the inflorescence. Peduncles several, terminal or in the upper axils, each with several spikes, forming a corymbose panicle.

Perianth-limb not above half as long as the tube.

Leaves rigidly linear, crowded, erect, 2 to 3 in. long . . . . . 1. *C. sphacelatum*.

Leaves linear, linear-oblong or lanceolate, erect or slightly spreading . . . . . 2. *C. taxifolium*.

1. **C. sphacelatum** (sphacelate), Hook. in Mitch. Trop. Austr. 342; Benth. Fl. Austr. v. 371. An erect shrub, the branches and young leaves silky or hoary-tomentose, the older foliage glabrous, the inflorescence pubescent. Leaves crowded, erect, linear, rigid, with a small callous point, obscurely 1-nerved, mostly 2 to 3 in. long. Peduncles in the upper axils longer than the leaves, bearing each several spikes, and forming a compact broad terminal corymb. Bracts broad, shortly acuminate. Perianth shortly pubescent, about 5 lines long, the limb about half as long as the tube, the lips nearly equal, the upper one broad, concave, shortly acuminate, the lower one divided to below the middle into 3 narrow lobes.—Meissn. in DC. Prod. xiv. 320.

Hab.: Near Mount Pluto, Mitchell.

2. **C. taxifolium** (Taxus-leaved), Sm. in Rees' Cycl. ix.; Benth. Fl. Austr. v. 372. An erect shrub of several ft., with virgate branches, minutely hoary-tomentose or glabrous, the inflorescence usually pubescent. Leaves crowded, linear or lanceolate, acute, rigid or slightly spreading, contracted at the base, mostly  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, but in a few specimens nearly lin. and the lower ones



even still longer. Peduncles in the upper axils usually rather numerous, 1 to 3in. long, rarely longer, each bearing several pedunculate spikes, the whole forming a more or less corymbose panicle. Bracts broad, acuminate, shorter than the perianth-tube. Perianth pubescent, 2½ to 3 lines long, the limb much shorter than the tube, the upper lip broad and concave, the lower rather longer, divided to the middle into narrow lobes.—R. Br. in Trans. Linn. Soc. x. 154, Prod. 368; Meissn. in DC. Prod. xiv. 319; Hook. f. Fl. Tasm. i. 319; Bot. Mag. t. 2724; *C. falcifolium*, Knight, Prot. 95 (*R. Br.*); *C. affine*, Roem. and Schult. Syst. iii. Mant. 274; *C. spicatum*, R. Br. Prot. Nov. 10; Meissn. in DC. l.c.; *C. propinquum*, R. Br. l.c.; Meissn. l.c.; *C. lavandulifolium*, A. Cunn.; Meissn. in Pl. Preiss. i. 519, and in DC. l.c.

Hab.: Moreton Island, *McGillivray*, *F. v. Mueller*; Estuary of the Burkekin, *Herb. F. Mueller*.  
Var. *linifolium*. Leaves more spreading and inflorescence.—Peel Island and Redcliffe Point, Moreton Bay, *A. Cunninghamham*.

4. PERSOONIA, Sm.

(After C. H. Persoon).

(Linkia, Cav.)

Flowers hermaphrodite. Perianth regular, cylindrical in the bud or constricted above the base, the segments free or nearly so, recurved in the upper portion, the laminae scarcely broader than the claws. Anthers all perfect except in one species) on short filaments inserted at or below the middle of the perianth-segments, the cells adnate to the connective. Hypogynous scales or glands usually small. Ovary stipitate (the stipes in a few species very thick and short), with a terminal style either short and inflexed or elongated and filiform, the stigma terminal; ovules 2 or rarely 1, orthotropous, pendulous with short funicles and not strictly collateral, one ovule with a longer funicle or attached lower down than the other. Fruit a drupe, with a succulent exocarp and a thick very hard endocarp, either 1-celled and 1-seeded, or obliquely 2-celled with a single seed in each cell.—Shrubs or small trees. Leaves entire, alternate, or rarely here and there almost whorled. Flowers yellow or white, solitary in the axils or owing to the abortion or reduction of the floral leaves forming short racemes at first terminal or axillary, or at length at the base of a leafy branch, rarely in slender terminal 1-sided racemes.

With the exception of a single New Zealand species the genus is limited to Australia.

SECT. 1. **Pycnostyles**.—Style short, often as thick as the ovary, incurved or hooked at the end, burying the stigma in a cavity of the upper perianth-segment below the anther.

Leaves flat, long, falcate, narrow or broad, 1-nerved. Tropical species . . . 1. *P. falcata*.

SECT. 2. **Amblyanthera**.—Style elongated beyond the anther-cells, with a terminal stigma. Connective of the anthers not produced beyond the cells. Stipes of the ovary inarticulate or articulate at the very base.

Ovary villous (rarely almost glabrous in *P. media*).

Leaves glabrous, flat, ovate, obovate, elliptical or broadly lanceolate

Perianth pubescent with appressed hairs.

Leaves mostly lanceolate. Perianth-segments tipped with dorsal points . . . . . 2. *P. media*.

Leaves mostly elliptical. Perianth-segments without points . . . . . 3. *P. cornifolia*.

Leaves pubescent or silky-villous, flat or with recurved margins, from lanceolate to obovate.

Leaves mostly obovate or oblong-spathulate . . . . . 4. *P. sericea*.

Leaves mostly narrow . . . . . 5. *P. Mitchellii*.

Leaves scabrous or hispid, with revolute margins. Leaves narrow-linear, spreading, incurved, ¾ to 1½in. long . . . . . 6. *P. fastigiata*.

Ovary glabrous. Flowers erect. Leaves flat, veined, mostly about 1½in., elliptical, falcate, lanceolate or linear, usually glabrous.

Stems prostrate or trailing. Leaves usually short and broad. Pedicels short . . . . . 7. *P. prostrata*.

Stems erect. Leaves rarely above 4in. when narrow, always shorter when broad.

Leaves mostly lanceolate or elliptical. Pedicels very short. Flowers solitary or rarely 2 together . . . . . 8. *P. lanceolata*.

Leaves linear, often very narrow. Flowers axillary. Ovary 2-ovulate . . . . . 9. *P. linearis*.

Ovary glabrous. Leaves narrow-linear. Pedicels slender . . . . . 10. *P. virgata*.

Ovary glabrous. Leaves filiform, not pungent. Ovary 2-ovulate. Perianth-segments without points . . . . . 11. *P. tenuifolia*.

1. ***P. falcata*** (falcate), *R. Br. in. Trans. Linn. Soc.* x. 162, *Prod.* 373; *Benth. Fl. Austr.* v. 385. "Tar-poon," Annan River, *Roth*; "Nanchee" and "Booral," Mitchell River, *Palmer*. Usually a small tree, glabrous or the young shoots minutely tomentose-pubescent. Leaves linear or lanceolate, falcate, 4 to 10in. long, and very variable in width, obtuse or acuminate, contracted into a petiole, the midrib prominent, the margins usually nerve-like, the lateral veins obscure or fine and very oblique. Pedicels slender,  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long, glabrous as well as the perianth or very minutely hoary-pubescent, sometimes all axillary, but more frequently forming a long raceme with the lower floral leaves reduced to bracts and growing out at the end into a leafy shoot. Ovary glabrous, of nearly uniform thickness with the short stipes and incurved style, the stigma oblique under the upper anther. Anthers all perfect, but the upper one usually smaller, the connective produced into a long or short point. Fruit ovoid-globose,  $\frac{1}{2}$ in. long.—*F. v. M. Fragm.* vi. 222; *Meissn. in DC. Prod.* xiv. 331; *P. mimosoides*, *A. Cunn. Herb.*

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Cape York, *Daemel*; Dayman's Island, Endeavour Straits, *W. Hill*; Endeavour River, *A. Cunningham*, *W. Hill*; Estuary of the Burdekin, *E. Fitzalan*; Kennedy District, *R. Daintree*; Edgecombe and Rockingham Bays, *J. Dallachy*; Cape and Bowen Rivers, *E. Bowman*; Annan River, *Dr. W. E. Roth*; Mitchell River, *E. Palmer*; Etheridge, *W. E. Armit*.

Fruit eaten.—*Roth and Palmer*.

Wood light with a reddish centre, hard and close-grained.—*Bailey's Cat. Ql. Woods*, No. 325

2. ***P. media*** (medium), *R. Br. Prot. Nor.* 16; *Benth. Fl. Austr.* v. 391. "Geebung," "Koombarra," Stradbroke Island, *Watkins*. A tall erect shrub, the young branches ferruginous-pubescent. Leaves lanceolate or almost elliptical, sometimes oblique or slightly falcate, acuminate or acute, contracted into a short petiole, 2 to 4in. long, flat, thin and glabrous, very obliquely veined. Pedicels axillary, 1 to 2 lines long, ferruginous or glabrous, solitary or very rarely irregularly clustered. Perianth fully five lines long, pubescent with short appressed hairs, the segments tipped with short subulate points. Anther connective not produced beyond the cells. Ovary more or less silky-hirsute but usually much less so than in *P. ferruginea* and *P. cornifolia* and the hairs sometimes almost disappearing, the stipes glabrous; style elongated, with a terminal stigma; ovules 2.—*Meissn. in DC. Prod.* xiv. 342.

Hab.: Brisbane River. Islands of Moreton Bay, and other southern localities.

Wood of a light colour, close in grain and firm; might prove useful for tool handles. It somewhat resembles the English Beech, and may prove as serviceable to musical instrument makers.—*Bailey's Cat. Ql. Woods*, No. 326.

3. ***P. cornifolia*** (Cornus-leaved), *A. Cunn. R. Br. Prot. Nor.* 16; *Benth. Fl. Austr.* v. 392. A tall erect shrub, the branches pubescent, the young leaves ciliate on the margins and sometimes pubescent, the adult foliage glabrous. Leaves from broadly obovate or ovate to elliptical-oblong or even broadly lanceolate, acute when narrow or obtuse when broad, usually mucronate, contracted into a very short petiole, mostly 1 to 2in. long, flat, rather rigid, the midrib slightly prominent and sometimes obscurely and very obliquely veined. Pedicels solitary in the axils or clustered on a very short axillary branch with the floral leaves reduced or abortive, sometimes very short, rarely 2 to 3 lines long. Perianth shortly silky-pubescent, 5 to 6 lines long, without points to the segments.

Anther-connective not produced beyond the cells. Ovary densely silky-villous, on a very short glabrous stipes; style elongated, with a terminal stigma; ovules 2.—Meissn. in DC. Prod. xiv. 341; *P. tinifolia*, A. Cunn. Herb.

Hab.: Logan and Brisbane Rivers, Moreton Bay and inland, *Fraser, Cunningham*; and from there to Stanthorpe.

The foliage of this species is very variable, but the leaves are usually shorter, broader, and less veined than in the preceding species, and the perianth has neither the ferruginous hairs of *P. ferruginea* nor the subulate tips of *P. media*; the hairs of the ovary are constantly dense.—*Benth.*

4. ***P. sericea*** (silky), *A. Cunn.*; *R. Br. Prot. Nov.* 14; *Benth. Fl. Austr.* v. 393. An erect shrub resembling at first sight some forms of *P. rigida*, but the indumentum softer; branches densely ferruginous-pubescent or villous. Leaves obovate oblong or oblanceolate, mucronate, but otherwise obtuse, contracted at the base but scarcely petiolate,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, flat, pubescent on both sides and in the broader leaved forms densely silky, penniveined. Flowers solitary in the axils but a few of the floral leaves sometimes much reduced. Pedicels villous, at first very short, 2 to 3 lines long when in fruit. Perianth pubescent, about 5 lines long, the segments obtuse, without points. Anther-connective not produced beyond the cells. Ovary densely villous, on a glabrous stipes; style elongated, villous; ovules 2. Meissn. in DC. Prod. xiv. 342.

Hab.: Stanthorpe.

5. ***P. Mitchellii*** (after Sir T. Mitchell), *Meissn. in Hook. Kew Journ.* vii. 73, and in DC. Prod. xiv. 342; *Benth. Fl. Austr.* v. 393. An erect shrub from 2 to 8 ft. high, with pubescent or villous branches. Leaves oblong-linear spatulate or rarely almost obovate, obtuse with a small point or acute, narrowed at the base, 1 to 2 in. long, pubescent when young, at length glabrous or nearly so. Pedicels 3 to 4 lines long, erect or recurved, axillary or forming terminal or subterminal racemes by the reduction of the floral leaves to small bracts. Perianth villous, 4 to 5 lines long, the segments without points. Anther-connective not produced beyond the cells. Ovary villous, on a glabrous stipes; style elongated; ovules 2.

Hab.: Burnett River, *Italy*; Brisbane River, Moreton Bay, *F. v. Mueller*; Mount Perry, *Jas. Keys*.

6. ***P. fastigiata*** (branches pointing upward), *R. Br. Prot. Nov.* 13; *Benth. Fl. Austr.* v. 393. A shrub with rather slender branches shortly pubescent. Leaves rather crowded, incurved, narrow-linear, scarcely acute, attenuate at the base, the margins recurved or revolute,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, more or less scabrous-pubescent. Pedicels slender, solitary or clustered in the axils (the floral leaves abortive), 1 to 2 lines long. Perianth minutely pubescent or hirsute, 3 to  $3\frac{1}{2}$  lines long. Anther-connective not produced beyond the cells. Ovary densely hirsute, on a glabrous stipes; style elongated; ovules 2.—Meissn. in DC. Prod. xiv. 337.

Hab.: Southern inland localities.

7. ***P. prostrata*** (prostrate), *R. Br. in Trans. Linn. Soc.* x. 163; *Prod.* 373; *Benth. Fl. Austr.* v. 395. A trailing prostrate or low and diffuse shrub, extending sometimes to 2 or 3 ft., glabrous or the young shoots slightly pubescent. Leaves broadly elliptical oblong or almost lanceolate, acute or mucronate, contracted into a very short petiole, 1 to  $1\frac{1}{2}$  in. long, not so rigid as in *P. cornifolia*, scarcely veined except the slightly prominent midrib. Pedicels short, axillary, solitary or clustered on reduced axillary shoots. Perianth glabrous, 4 to 5 lines long, the segments without terminal points. Anther-connective not produced beyond the cells. Ovary stipitate, glabrous; style elongated; ovules 2.—Meissn. in DC. Prod. xiv. 342; *P. daphnoides*, A. Cunn.; *R. Br. Prot. Nov.* 15; Meissn. in DC. Prod. xiv. 339.

Hab.: Sandy Cape, Hervey Bay, *R. Brown*, and near Wallangarra.

8. ***P. lanceolata*** (lanceolate), *Andr. Bot. Rep. t. 74*; *Benth. Fl. Austr. v. 395*. An erect shrub of several feet, the branches and young shoots hoary-pubescent, the adult foliage glabrous or nearly so. Leaves lanceolate or oblong-lanceolate, mucronate-acute, much contracted into a short petiole, mostly  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. long, flat, the midrib slightly prominent, the margins scarcely nerved, otherwise veinless. Pedicels exceedingly short, solitary or 2 together, pubescent, rarely 1 line long. Perianth about 5 lines long, pubescent with very short appressed hairs, the segments without terminal points. Anther-connective not produced beyond the cells. Ovary glabrous, contracted into a short stipes; style elongated; ovules 2.—*R. Br. in Trans. Linn. Soc. x. 162, Prod. 373*; *Meissn. in DC. Prod. xiv. 340*; *Lodd. Bot. Cab. t. 25*; *P. ligustrina*, Knight, *Prot. 100*; *P. glaucescens*, Sieb. in *Roem. and Schult. Syst. iii. Mant. 271*.

Hab.: Near Wallangarra.

9. ***P. linearis*** (linear), *Andr. Bot. Rep. t. 77*; *Benth. Fl. Austr. v. 397*. A tall shrub or small tree of 10 to 20 ft., the young branches pubescent or villous, the adult foliage usually glabrous. Leaves rather crowded, linear, acute or almost obtuse, contracted at the base, 1 to 2 in. long,  $\frac{3}{4}$  to  $1\frac{1}{2}$  line broad, obscurely veined. Pedicels solitary, 1 to 3 lines long. Perianth about 5 lines long, more or less pubescent with short appressed hairs. Anther-connective not produced beyond the cells. Ovary glabrous, stipitate; style elongated; ovules 2. Drupe ovoid.—*R. Br. in Trans. Linn. Soc. x. 161, Prod. 372*; *Meissn. in DC. Prod. xiv. 335*; *Vent. Jard. Malm. t. 32*; *Bot. Mag. t. 760*; *P. angustifolia*, Knight, *Prot. 99*; *P. pinifolia*, Sieb. *Pl. Exs.*; *P. filifolia*, Dietr.; *Roem. and Schult. Syst. iii. 401*; *P. pruinosa*, A. Cunn.; *Steud. Nom. Bot. ed. 2?* (the specimens not in flower); *Pentadactylon angustifolium*, Gærtn. f. *Fr. iii. 219, t. 220*; *Persoonia pentadactylon* *Steud. Nom. Bot. ed. 2*.

Hab.: Stradbroke Island, *Fraser*.

10. ***P. virgata*** (twiggy), *R. Br. in Trans. Linn. Soc. x. 161*; *Prod. 372*; *Benth. Fl. Austr. v. 402*. A large shrub, with numerous slender branches more or less pubescent, the adult foliage glabrous or nearly so. Leaves narrow-linear, acuminate, contracted at the base, 1 to  $1\frac{1}{2}$  in. long, flat, concave or grooved above, convex underneath without any prominent midrib. Pedicels slender, glabrous or minutely pubescent, about  $\frac{1}{4}$  in. long. Perianth glabrous, 4 to  $4\frac{1}{2}$  lines long, the segments tipped with minute points. Anther-connective not produced beyond the cells. Ovary glabrous, on a rather short and thick stipes; style elongated; ovules 2.—*Meissn. in DC. Prod. xiv. 338*; *P. linariifolia*, A. Cunn. *Herb.*; *P. tenuifolia*, *Meissn. l.c. 334*, not of *R. Br.*

Hab.: Sandy Cape, Hervey Bay, *R. Brown*; sandy shores of Stradbroke Island, *A. Cunningham, Fraser*; Moreton Island, *M'Gillivray, F. v. Mueller*; Pine River, *E. Fitzalan*.

11. ***P. tenuifolia*** (leaves slender), *R. Br. Prod. Nov. 12*, but not of *Meissn.*; *Benth. Fl. Austr. v. 403*. A shrub with slender slightly pubescent branches. Leaves crowded, filiform, more or less spreading, acute but not pungent, nearly terete, grooved above, glabrous,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Pedicels axillary, rarely 1 line long. Perianth glabrous, 4 to 5 lines long, the segments without subulate points. Anther-connective not produced beyond the cells. Ovary stipitate, glabrous; style elongated; ovules 2. Fruit broad.

Hab.: Logan and Brisbane Rivers, *Fraser*; Glasshouses and Moreton Bay, *F. v. Mueller*; Stanthorpe and Wallangarra.

## 5. HELICIA, Lour.

(*Cyanscarpus*, *Bail.*)

Flowers hermaphrodite. Perianth regular, the tube slender, the laminae small, the segments all much revolute when separating. Anthers on short filaments inserted a little below the laminae, the connective produced into a short appen-

dage. Hypogynous glands equal, distinct or united in a ring or cup round the ovary. Ovary sessile, with a long straight style, slightly thickened at the end with a terminal stigma; ovules 2. Fruit nearly globular, indehiscent with a fleshy exocarp. Seeds solitary and globular, endocarp cartilaginous; cotyledons thick and fleshy.—Trees or tall shrubs. Leaves alternate, rarely verticillate, entire or toothed. Flowers pedicellate in pairs, in terminal or axillary simple racemes, the pedicels of each pair often more or less connate. Bracts often very deciduous.

The genus is spread over tropical Asia extending northwards to Japan. The Australian species appear to be all endemic.

It is only of quite recent date that fruits of the Queensland species of *Helicia*, *Macadamia* and *Cyanocarpus* have become known, and from what I have seen of these have come to the conclusion that it will be better to allow *Cyanocarpus* to lapse, and to arrange the Queensland species thus:—

Those with dehiscent fruits with fleshy or juicy exocarp, and thin or cartilaginous endocarp, under *Helicia*.

Those with 2-valved or irregularly dehiscent fruits, with more or less coriaceous deciduous exocarp and hard bony endocarp, under *Macadamia*.

- |                                                                                                                                                                                                                                                 |                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| A tall shrub. Leaves verticillate, 4 to 7 in. long, 1 to 1½ in. broad, glossy, lanceolate, entire or toothed. Racemes terminal, 4 in. long. Flowers white, about 9 lines long. Fruit oval-globose, pointed at both ends, 1½ in. long, vermilion | 1. <i>H. Youngiana</i> .   |
| Tree, glabrous. Leaves of thin texture, nerves distant, oblong, 3 to 7 in., entire, abruptly acuminate. Racemes terminal, 2 to 4 in. long. Fruit oval, red, 1 in. long                                                                          | 2. <i>H. Cribbiana</i> .   |
| Tree, glabrous. Leaves obtuse or obtusely acuminate, 2 to 4 in. long, entire or toothed, nearly sessile. Racemes slender, usually axillary, 2 to 4 in. long. Fruit blue, oblong, 1 in. long                                                     | 3. <i>H. glabriflora</i> . |
| Tree clothed with rusty hairs. Leaves oblong to lanceolate, 3 to 4 in. long, toothed. Fruit blue, about 5 lines long                                                                                                                            | 4. <i>H. ferruginea</i> .  |
| Tree or tall shrub clothed with rusty hairs when young. Leaves ovate-lanceolate, more or less toothed, texture membranous, 4 to 7 in. long. Racemes axillary, 2 to 4 in. long. Fruit, blue, oval, ½ in. long                                    | 5. <i>H. Nortoniana</i> ,  |
| Tree, glabrous. Leaves oval, obtuse, or with a long obtuse point, 4 to 5 in. long. Racemes axillary. Pedicels very short. Fruit not seen                                                                                                        | 6. <i>australasica</i> .   |
| Tree, slender, glabrous. Leaves 4 to 7 in. long, 1 to 1½ in. broad, cuneate to lanceolate, glossy on both sides. Racemes lateral, including the peduncle 2½ to 3½ in. long. Bracts minute, numerous. Perianth crimson                           | 7. <i>H. Heyana</i> .      |

1. **H. Youngiana** (after Sir John Young), *Chas. Moore and F. v. M. Fragm.* iv, 84, and *Bot. Bull.* v. 26. A tall rather straggling shrub, the young branchlets and inflorescence ferruginous-pubescent. Leaves bright green, shortly petiolate, in whorls of 3 or 4, oblong-lanceolate, often long acuminate, entire or more or less toothed, 4 to 7 in. long, glabrous and glossy above, silky underneath when young. Racemes terminal, about 4 in. long. Pedicels ferruginous-pubescent about 2 lines long. Bracts ciliate. Perianth white, about 2 lines long. Anther-connective produced into a short obtuse appendage. Hypogynous glands oblong distinct. Ovary villous. Style-end ovoid. Fruit vermilion, from globose to oval, and more or less pointed at each end, attaining 1½ in. long and 1½ in. diameter, indehiscent, slightly pubescent; suture prominent. The fruit becoming uneven or rugose in drying; exocarp somewhat fleshy, quite free from the seed, which latter is globose and only covered by a thin, felt-like integument or endocarp.—*Macadamia Youngiana*, F. v. M., Benth. Fl. Austr. v. 406.

Hab.: Yandina and Eumundi Scrubs, North Coast Railway.

The fruits of this plant have been suspected of poisonous properties.

2. **H. Cribbiana** (after J. G. Cribb), *Bail.* A glabrous tree about 20 ft. high. Leaves oblong to oblanceolate, 3 to 7 in. long, entire on all the specimens to hand, often clustered at the ends of the branchlets, particularly the branchlets which form long internodes, thin-coriaceous, tapering from above the middle to a petioles of 3 to 6 lines, the apex abruptly-acuminate; primary veins distant,

and the finer reticulation faint on both sides. Racemes, several at the ends of the branchlets, 2 to 4 in. long (only seen in fruit). Fruit oval, red, about 1 in. long, pedicels about 2 lines, exocarp fleshy, endocarp thin, almost cartilaginous.—*Cyanocarpus Cribbiana*, Bail. Ql. Agri. Journ. i. Pt. v.

Hab.: Mourilyan District, *E. Cowley*, Sept. 1897.

3. **H. glabriflora** (flowers glabrous), *F. r. M. Fragm.* ii. 91; *Benth. Fl. Austr.* v. 405. A small tree quite glabrous. Leaves ovate-elliptical, obtuse or obtusely acuminate, entire or very rarely toothed, contracted into a short petiole, 2 to 4 in. long, coriaceous with the veins less conspicuous than in *H. australasica*. Racemes terminal axillary or lateral, very slender, glabrous, about as long as the leaves, the rhachis almost filiform. Pedicels free or shortly united at the base,  $\frac{1}{2}$  to 1 line long. Perianth very slender, glabrous, about 4 lines long. Hypogynous glands more or less connate in a truncate ring or cup. Fruit oblong, about  $\frac{1}{2}$  in. long, exocarp juicy, blue, endocarp cartilaginous.—*H. conjunctiflora*, *F. v. M. Fragm.* v. 38.

Hab.: North Coast Railway.

4. **H. ferruginea** (ferruginous), *F. r. M. Fragm.* iii. 37; *Benth. Fl. Austr.* v. 405. A moderate-sized tree, the branches and inflorescence densely villous with ferruginous or fulvous hairs, which often persist on the principal veins of the underside of the leaves. Leaves shortly petiolate, ovate-elliptical or oblong, acuminate or lanceolate, serrate, contracted or rounded at the base, 3 to 4 in. long in some specimens, twice that size in others, the veins very prominent underneath, the primary ones sometimes numerous and regular, in others fewer and more unequal, the minor reticulations also very variable. Racemes terminal or axillary, rather dense, shorter than the leaves. Flowers small, in pairs on a very short common pedicel. Perianth slender, densely rufous-villous,  $2\frac{1}{2}$  to 3 lines long. Hypogynous glands short and broad, irregular, 2 of them sometimes united. Fruit blue, oval, about 5 lines long, exocarp juicy, endocarp cartilaginous.

Hab.: Mountain scrubs of the southern parts; Rockingham Bay, Barron River, and other northern localities.

Wood of a dark-pink colour, prettily figured, close-grained, and useful for both the cabinet-maker and boatbuilder,—*Bailey's Cat. Ql. Woods*, No. 331A and B.

5. **H. Nortoniana** (after the Hon. A. Norton), *Bail.* A small tree, the branches when young clothed with dark-reddish short hairs. Leaves alternate, broadly lanceolate or ovate-lanceolate, 4 to 7 in. long, 1 to 3 in. broad, irregularly but sharply serrate, the apex more or less elongated; petioles short, which with the primary veins are clothed with rusty hairs like the branchlets; texture membranous, upper surface glossy; primary veins prominent, joining some distance within the margin. Racemes axillary, 2 to 4 in. long, ferruginous. Flowers in pairs, the pedicels short, connate, straight and slender in the bud, about 3 lines long, the segments closely revolute when expanded, glabrous inside. Filaments equal in length with the anther, incurved. Style erect, glabrous. Stigma clavate. Ovary sessile, very hairy. Fruit a bright-blue oval juicy drupe, about  $\frac{1}{2}$  in. long, more or less hairy, and bearing the persistent, slender, straight style.—*Cyanocarpus Nortoniana*, Bail. 3rd. Suppl. Syn. Ql, Fl. 61.

Hab.: Tringilburra Creek and creeks off Russell River.

6. **H. australasica** (Australasian), *F. r. M. in Hook. Kew. Journ.* ix. 27; *Benth. Fl. Austr.* v. 405. A small tree, quite glabrous. Leaves oval-elliptical, obtuse or acuminate, entire or irregularly toothed, contracted into a very short petiole, glabrous and veined on both sides, 4 to 5 in. long. Racemes axillary or lateral, shorter than the leaves or rarely exceeding the shorter upper ones, quite

glabrous. Flowers in pairs on an exceedingly short common pedicel so as to appear almost sessile on the rachis. Perianth slender, glabrous, scarcely  $\frac{1}{2}$  in. long. Hypogynous glands broad and truncate so as apparently to form a ring or cup, but really free. Ovary villous. Fruit not seen.

Hab.: Barron River, *E. Cowley*.

7. **H. Heyana** (after Rev. Nicholas Hey, of Mapoon), *Bail.* A beautiful slender tree, 15 to 20ft. high, quite glabrous. Leaves 4 to 7in. long, 1 to 1½ in. broad in the upper part, cuneate to lanceolate, sometimes obtuse or obtuse-acuminate, both sides glossy, lateral nerves numerous joining in an inter-marginal one near the edge, reticulate veins close, margins entire or here and there a minute gland-like tooth, on very short petioles. Racemes lateral, including the short peduncle from 2½ to 3½ in. long. Flowers in pairs, slender, 3 lines long, connate to the middle; bracts minute, lanceolate, numerous on the peduncle, rather persistent. Perianth crimson, 10 lines long in the bud. Style-end pyramidal-conical (no expanded flowers on the specimens preserved). Hypogynous glands broad-truncate. No fruit seen.

Hab.: Palm Camp, Bellenden Ker, *Bail.* (Bellenden Ker Exped., 1889).

## 6. MACADAMIA, F. v. M.

(After —. Macadam).

Flowers hermaphrodite. Perianth regular or slightly irregular. Anthers on short filaments, inserted a little below the laminæ, the connective produced into a gland or very short appendage. Hypogynous glands equal, distinct or united in a ring or cup round the ovary. Ovary sessile, with a long straight style, ovoid or clavate at the end, with a small terminal stigma; ovules 2 (in *M. ternifolia*). Fruit globular. Seeds either solitary and globular or 2 and hemispherical; testa membranous; cotyledons thick and fleshy.—Trees or tall shrubs. Leaves sometimes verticillate, entire or serrate. Flowers pedicellate in pairs or scattered in terminal or axillary simple racemes or panicles, the pedicels not usually connate. Bracts more or less deciduous.

The genus is endemic in Australia.

Trees. Leaves verticillate or opposite, usually in whorls of 3 or 4 oblong or lanceolate, serrated or entire, 5 to 12in. long. Racemes pendulous, axillary, long as the leaves; flowers small, numerous. Pedicels free. Perianth about 3 lines long. Fruit globose 2-valved or bursting irregularly. Seeds globose if 1, hemispherical when 2. . . . .

1. *M. ternifolia*.

Tree, glabrous. Leaves opposite or in whorls 3 to 6, broad-lanceolate, 4 to 7in. long, margins entire. Peduncles several in a whorl of leaves at the ends of the branchlets, slender, hoary and about 4in. long, bearing 1 or 2 whorls of pedunculate racemes crowded with hirsute flowers. Pedicels free. Fruit globose, 2in. diameter, 2-valved or bursting irregularly. Seeds globose if 1, hemispherical if 2. . . . .

2. *M. Whelani*.

Tree. Leaves lanceolate 3 to 10in. long. Racemes axillary or lateral, long as the leaves. Pedicels connate for about half their length. Fruit globose, 2-valved, 1 to 2in. diameter. Seeds globose when 1, hemispherical when 2. . . . .

3. *M. præalta*.

1. **M. ternifolia** (leaves in threes), *F. v. M. in Trans. Phil. Inst. Vict.* ii. 72, with a plate; *Benth. Fl. Austr.* v. 406. A tall tree (typical form), with a very dense foliage, glabrous, or the young branchlets and inflorescence minutely pubescent. Leaves sessile or nearly so, in whorls of 3 or 4, or some opposite, oblong or lanceolate, acute or obtuse, serrate with fine or prickly teeth, or quite entire, from a few inches to 1ft. long. Racemes as long as the leaves, with numerous short flowers, the pairs almost clustered or almost verticillate. Pedicels at first very small and not above 2 lines when in fruit. Perianth minutely pubescent or glabrous, nearly 3 lines long. Hypogynous glands united in a ring.

Ovary villous; style-end clavate. Fruit with a 2-valved coriaceous exocarp; endocarp smooth and shining, thick and bony, seeds often above 1 in. diameter, globular or 2 and hemispherical.—*Helicia ternifolia*, F. v. M. Fragm. ii. 91, vi. 191.

Hab.: Pine River and Moreton Bay, *W. Hill*; Dawson and Burnett Rivers.

Wood of a red colour, close-grained, firm, and prettily marked; will doubtless become a favourite wood with the cabinet-makers.—*Bailey's Cat. Ql. Woods*, No. 328.

There are probably three forms of this species, viz., the typical; another with nuts only half the size of the typical. These nuts I have only received from the Pine River, but hitherto I have never received specimens of other parts of the tree or shrub. The third seems only to differ from the typical form in the leaves being usually more lanceolate and in habit. It grows in the Muroochie scrubs, and instead of a single stem several arise from a spreading rhizome-like base some little distance from each other. These attain the height of 15 or more feet, and are said after fruiting to die early; the leaves are of thinner texture than the typical form but the nut differs in nothing from the common form.

**2. *M. Whelani*** (after Sergeant E. J. Whelan), *Bail.* A glabrous tree of medium size. Trunk erect, bark smoothish, not thick, seldom more than  $\frac{1}{2}$  in. on old trees; the branches opposite or whorled, reddish when young; wood with the usual grain of the order and deep red. Leaves opposite or more frequently at the ends of the branches in whorls of 3 to 6, petiolate, lanceolate, 4 to 7 in. long, 1 to 3 in. broad, the points more or less elongated, midrib prominent; reticulations close, prominent in the dried leaf but scarcely so when fresh, margins entire. Panicles erect, terminal, puberulous, numerous, starting from a whorl of leaves. Peduncles slender, 3 or 4 inches long, branches in 1 or 2 whorls of 3 to 9, pedunculate, spike-like racemes  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. long, including the peduncle, which is about one-third of the length. Flowers scattered. Pedicels free, which, with the rhachis, is densely covered by short white hairs, about 1 line long. Perianths would appear from the dried specimen to be white, slightly longer than the pedicels, glabrous, or with a few scattered white hairs on the outside, revolute to the base. Filaments flat, inserted near the base of the perianth-segments. Anthers with prominent gland-like connectives. Hypogynous glands united, forming a cup. Ovary clothed with white hairs; style angular, glabrous. Fruit slightly ferruginous, globular, 2 or more inches in diameter, over  $2\frac{1}{2}$  in. when containing twin nuts; exocarp coriaceous, 2-valved, nuts globular when solitary, hemispherical when 2 in a fruit; endocarp bony of a light-brown and glossy; testa dark-brown and wrinkled like the kernel.—*Helicia Whelani*, *Bail.* 3rd Suppl. Syn. Ql. Fl. 61.

Hab.: Abundant along Tringilburra Creek, and thence to Whelanian Pools.

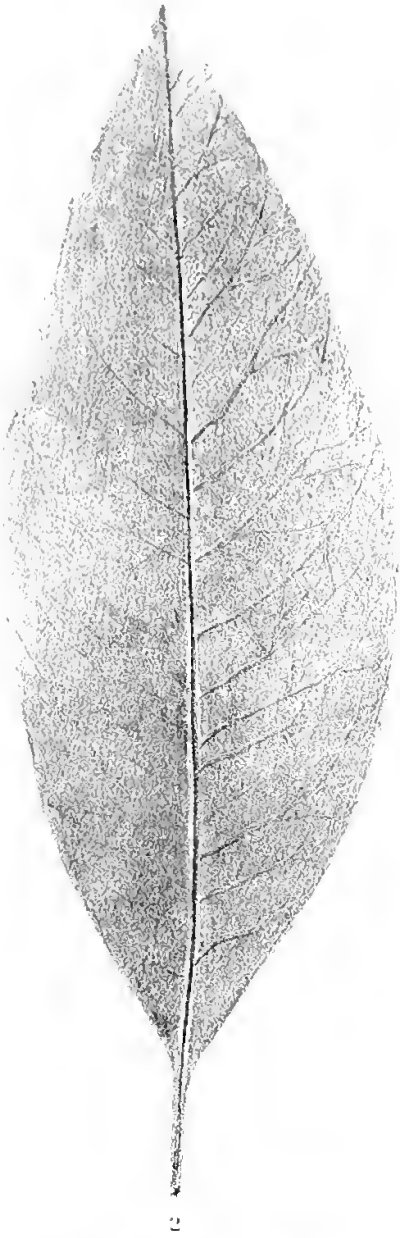
The nuts seem to be largely used by the natives of this locality for food, as we found large quantities of the broken shells as well as the whole nuts at all their camps.—*Bail.* (Bellenden Ker Exped., 1889),

**3. *M. præalta*** (very high), *Bail.* A moderate-sized or sometimes lofty tree, glabrous except the inflorescence which is often minutely tomentose. Leaves lanceolate, usually narrow, obtuse or acuminate, contracted into a petiole, quite entire, only 3 or 4 in. long in a few specimens, mostly 6 to 10 in. in others, coriaceous, often shining, penniveined and reticulate, the veins fine. Racemes axillary or lateral, 3 to 6 in. long, the rhachis rigid. Pedicels 2 to 3 lines long, united to above the middle. Perianth 7 to 8 lines long. Hypogynous glands quite distinct and narrow. Ovary glabrous. Fruit globular, 1 to 2 in. diameter, 2-valved, exocarp coriaceous, nuts globose or 2 and hemispherical; endocarp somewhat rugose, bony, but not very thick.—*Helicia præalta*, F. v. M. Fragm. iii. 37; Benth. in Fl. Austr. v. 404.

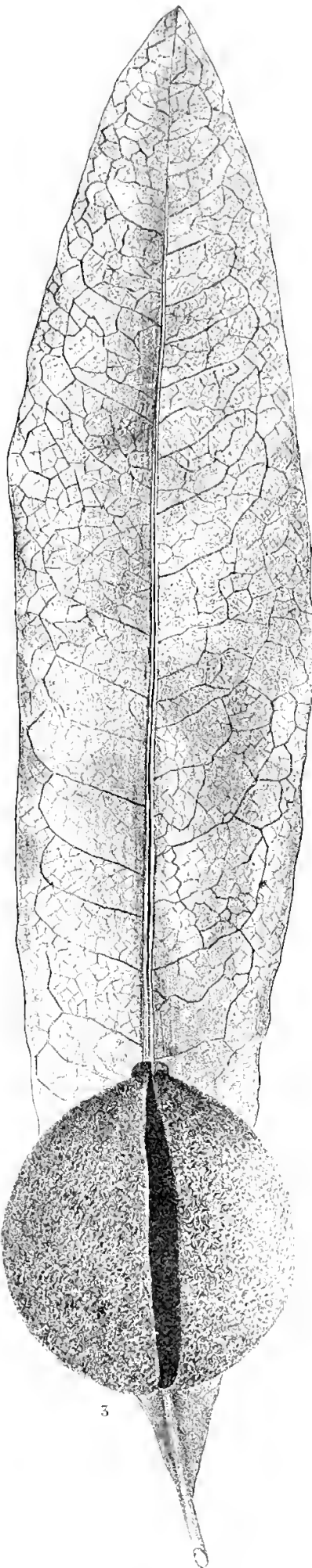
Hab.: Southern scrubs, generally on mountain sides.

Wood of a red colour, nicely marked, close in the grain, tough, strong, and durable; useful for cabinet-work, handles of tools, and other purposes. When newly cut it has a very disagreeable odour.—*Bailey's Cat. Ql. Woods*, No. 331.

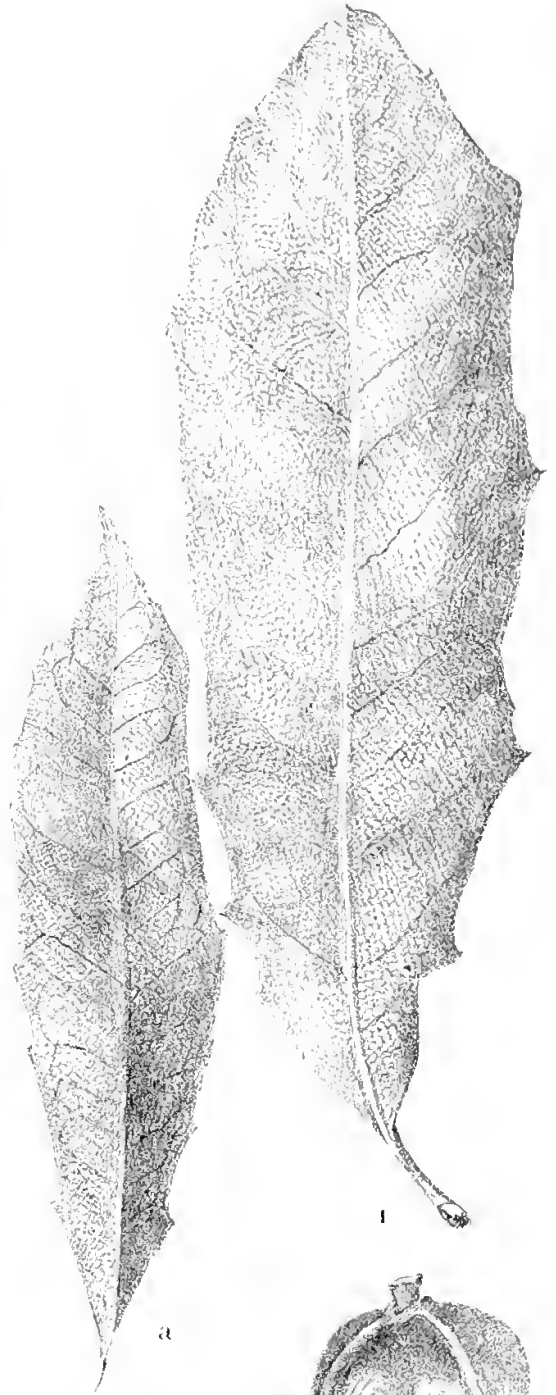




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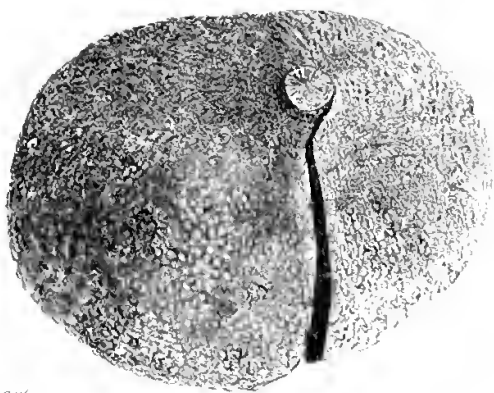


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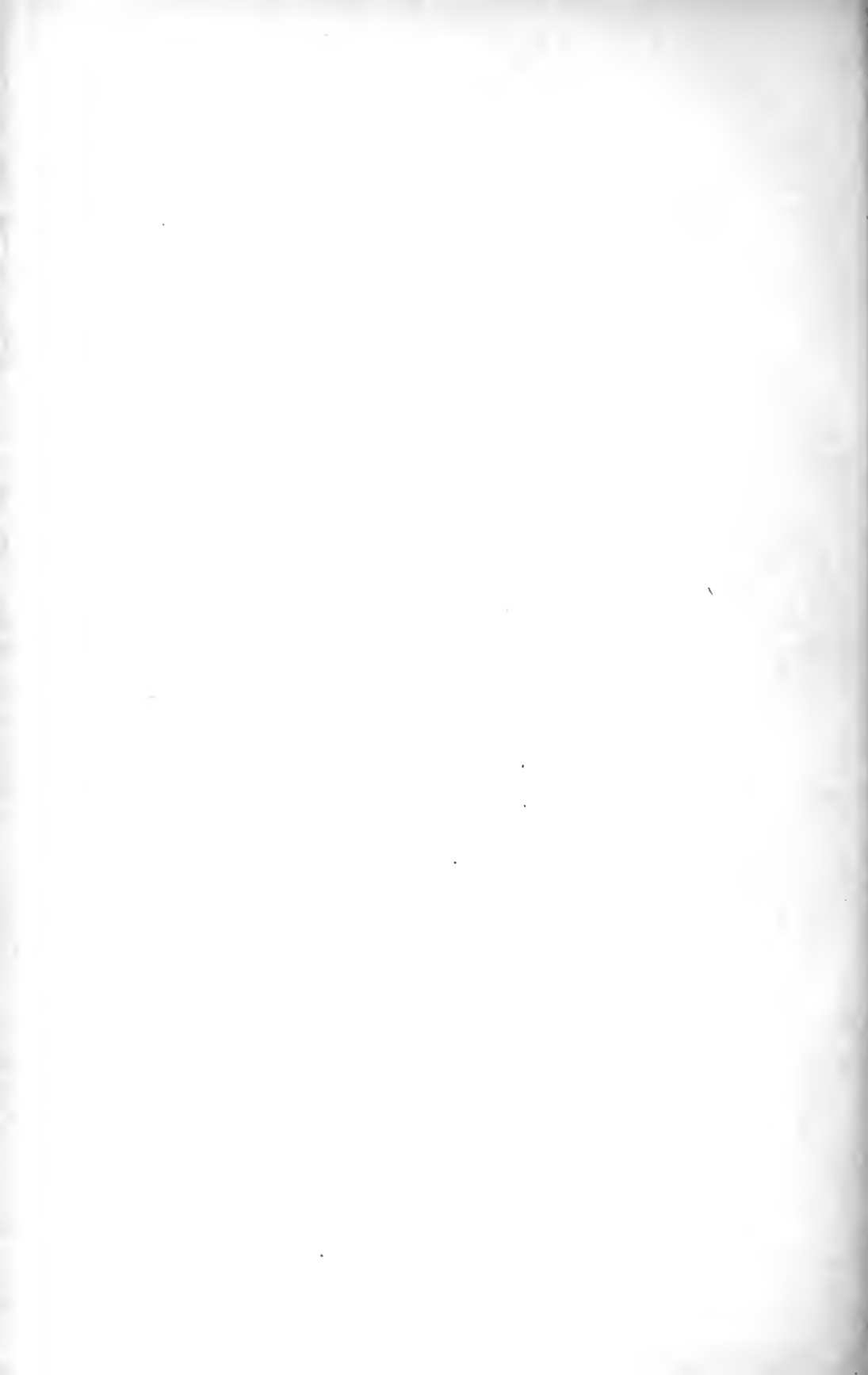


1 *ternifolia* and var. a F & M

2 *Whelanii*, Eng. 3 *pruvatta* Eng.

Macadamia

Gen. Fagifolia Orme, ben. sp.



7. **XYLOMELUM**, Sm.

(Woody pear.)

Flowers partially polygamous. Perianth regular, nearly cylindrical in the bud, the segments revolute, dilated at the end into short concave laminae. Anthers apparently perfect in all the flowers, on short filaments inserted a little below the laminae, the connective produced beyond the cells in a short obtuse or gland-like appendage. Hypogynous glands 4, small. Ovary in the fertile flowers shortly stipitate or almost sessile, tapering into a filiform style clavate at the end, with a terminal stigma either small and scarcely prominent or large thick and pulvinate; ovules 2 laterally attached below the middle; in the sterile flowers the ovary is abortive, but the style is clavate at the end though without any stigmatic surface. Fruit large, ovoid or tapering above the middle, very thick and woody, tardily opening along the upper side or in 2 valves. Seeds flat, obliquely ovate, with a long terminal oblique or falcate wing.—Trees or tall shrubs. Leaves opposite, entire or prickly-toothed. Flowers in opposite dense spikes, axillary or at first forming a terminal cluster, becoming lateral by the elongation of the branch. Bracts small, at first imbricate, but falling off long before the flowering. Flowers sessile in pairs within each bract, the lower ones of the spike usually perfect, the upper ones with abortive ovaries.

The genus is endemic in Australia, where it is widely spread, the fruits generally known under the name of *wooden pears*.

Leaves veined, those at least of the barren branches prickly-toothed.

Perianth ferruginous-villous, 5 to 6 lines long. Leaves of the flowering branches usually entire . . . . . 1. *X. pyriforme*.

Leaves all quite entire. Perianth silky, under 4 lines long.

Leaves lanceolate, often falcate, veined. Fruits nearly glabrous, narrow. 2. *X. salicinum*.

1. ***X. pyriforme*** (pear-shaped), *Knight, Prot.* 105; *Benth. Fl. Austr.* v. 408. A tree of moderate size, the young shoots ferruginous-villous or tomentose, but becoming glabrous, the spikes remaining densely tomentose-villous. Leaves of the flowering branches usually entire, lanceolate or ovate-lanceolate, very acute, 4 to 6 in. long and tapering into a rather long petiole, those of the flowerless branches or of the younger plants often sinuate and prickly-toothed and attaining 8 in. with short petioles, all at length coriaceous and shining. Spikes very dense, 2 to 3 in. long, usually clustered 3 to 6 together and at first appearing terminal, but soon lateral by the growing out of the shoots. Bracts woolly-villous, orbicular,  $1\frac{1}{2}$  to 2 lines diameter. Perianth about 5 lines long. Style-end clavate. Fruit  $2\frac{1}{2}$  to 3 in. long and above 1 in. diameter near the base, somewhat tapering above the middle.—R. Br. in *Trans. Linn. Soc.* x. 189, *Prod.* 387, *Prot.* Nov. 31; Meissn. in *DC. Prod.* xiv. 422; *Endl. Iconogr.* t. 47, 48; *Reichb. Ic. Exot.* t. 90; *Banksia pyriformis*, Gærtn. *Fr.* i. 220, t. 47; Sm. in *White, Voy.* 224, t. 21; *Hakea pyriformis*, Cav. *Anal. Hist. Nat.* i. 217, *Ic.* vi. 25, t. 536; *Conchium pyriforme*, Wild. *Enum. Hort. Berol.* 141.

Hab.: From southern border to Dawson River.

Wood dark-red, coarse-grained, prettily figured; suitable for cabinet-work.—*Bailey's Cat. Ql. Woods*, No. 329.

2. ***X. salicinum*** (willow-leaved), *A. Cunn. in R. Br. Prot. Nov.* 31; *Benth. Fl. Austr.* v. 408. A small tree, glabrous except the inflorescence or the young shoots minutely hoary-pubescent. Leaves lanceolate, broad or narrow, obtuse, falcate, entire, contracted into a slender petiole, 4 to 8 in. long, of a pale green above, usually glaucous or whitish underneath. Spikes  $1\frac{1}{2}$  to 2 in. long, the rhachis and flowers tomentose-pubescent and whitish, sometimes silvery. Bracts small and broad, imbricate in the very young spike, but very deciduous. Perianth 3 to  $3\frac{1}{2}$  lines long. Ovary villous. Style shortly clavate, and in the fertile flowers capped by a thick broad pulvinate stigma, which has not been observed in

any other species. Fruit  $2\frac{1}{2}$  to 3 in. long, not so broad as in *X. pyriforme* and tapering into a thick beak recurved at the end.—*X. pyriforme* var. *salicinum*, R. Br. Prot. Nov 31; Meissn in DC. Prod. xiv. 423; *Helicia Scottiana*, F. v. M. Fragm. iv. 107; *Xylomelum Scottianum*, F. v. M. Fragm. v. 174, 215.

Hab.: Moreton Bay, A. Cunningham; Dogwood Creek, Leichhardt; Rockingham Bay, J. Dallachy; Darling Downs, Lau; Fraser's Island, Hon. Miss Lovell; Endeavour River, W. A. Persieh; Musgrave. Cape York Peninsula, Geo. Jacobson; Thursday Island.

Wood of a dark-red colour, close in grain, tough and durable.—*Bailey's Cat. Ql. Woods*, No. 333.

## 8. ORITES, R. Br.

(Mountain plants).

(Oritina, R. Br.)

Flowers hermaphrodite. Perianth regular, nearly cylindrical in the bud, the segments free or nearly so, dilated at the end into short usually concave laminae. Anthers all perfect, enclosed in the perianth-laminae in the bud, but with short filaments inserted below the laminae, the cells adnate to the slender connective which is not produced beyond them and is often scarcely conspicuous. Hypogynous glands linear, obtuse. Ovary sessile, with a terminal filiform straight style, scarcely thickened at the end, obtuse, with a small terminal stigma; ovules 2, amphitropous, laterally attached at or below the middle. Fruit an obliquely acute coriaceous follicle, more or less boat-shaped, the dorsal suture curved, the ventral one nearly straight. Seed compressed, with a terminal oblique or falcate wing, sometimes decurrent along the margins.—Shrubs or trees. Leaves alternate, more or less petiolate, entire toothed or rarely (in the same species) lobed. Flowers small, in terminal or axillary spikes, sessile or nearly so, in pairs within each bract. Bracts concave, imbricate in the very young spike but often falling off long before the flowers expand.

The genus is endemic in Australia.

Spikes all axillary. Leaves lanceolate, often toothed or divided on the barren branches. Tall tree. Leaves mostly above 4 in. Branches inflorescence and ovary glabrous . . . . .

1. *O. excelsa*.

Spikes nearly terminal. Small tree. Leaves ovate, usually less than 4 in. long, entire . . . . .

2. *O. fragrans*.

1. ***O. excelsa*** (tall), R. Br. Prot. Nov. 32; Benth. Fl. Austr. v. 411. A handsome tree of 40 to 60 ft., usually quite glabrous. Leaves on the flowering branches lanceolate, obtuse or acute, tapering in a rather long petiole, entire or slightly toothed, 4 to 6 in. long, flat, reticulate, shining above, glaucous underneath; those of the barren branches often larger, toothed or deeply divided into 3 or 5 lanceolate toothed lobes. Spikes axillary, interrupted, shorter than the leaves, usually glabrous, the flowers in distant pairs. Bracts at first ovate acute and imbricate, but falling off at a very early stage. Perianth glabrous, about 3 lines long. Filaments broad, attached to about the middle of the claws. Ovary glabrous; style short. Follicle acuminate, about 1 in. long. Seed flat, the nucleus about 4 lines long, with a terminal wing at least as long.—Meissn. in DC. Prod. xiv. 423.

Hab.: Mount Mistake.

Wood dark towards the centre of the tree, the outer part yellowish and often prettily marked, close-grained, easy to work; a useful wood for the joiner and cabinet-maker.—*Bailey's Cat. Ql. Woods*, No. 332.

2. ***O. fragrans*** (fragrant), Bail. 3rd Suppl. Syn. Ql. Fl. 61. A tall shrub or small tree with dense spreading head, glabrous except the inflorescence and a slight hoariness on the young growth; the twigs or branches bearing the flowers purplish or reddish. Leaves alternate, ovate-obtuse, emarginate or somewhat pointed,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  in. long, and 1 to 2 in. broad; the margins quite entire, pale on

the under surface; texture thin coriaceous, on slender coloured petioles of about 1 in. Spikes numerous in the upper axils, about 2 to 3 in. long, at an early stage closely covered with broadly-ovate, apiculate and prominently striated, imbricate, fugacious bracts of a bright crimson colour. Rhachis densely ferruginous pubescent. Perianth 3 to 4 lines, segments much recurved in the expanded flower. Filaments broad, attached to the middle of the segment. Anther about as long as the filament. Ovary purple and silky, but less so than the style which is very hairy and as long as the perianth.

Hab.: On the highest peaks of the Bellenden Ker Range.

### 9. KERMADECIA, Brongn.

Flowers hermaphrodite, a little irregular. Perianth-tube oblique, a little dilated at the base; limb oblong or sub-globose, straight or slightly incurved, the segments loose when in flower, limb concave. Anthers subsessile on the limb, oblong, connective, somewhat broad, shortly apiculate. Hypogynous disk unilateral, semiannular, fleshy, entire or shortly 2-lobed. Ovary oblique, subsessile on the receptacle. Style thickened or subclavate at the apex. Stigma oblique, terminal; ovules 2, collateral, pendulous from the top of the cell, orthotropal. Fruit oblong or sub-globose, indehiscent, pericarp thick fleshy. Seeds unknown.—Trees. Leaves alternate, coriaceous, quite entire or undivided or pinnate on the same tree. Flowers small, racemose or paniculate. Bracts minute, very caducous or wanting.—*From Benth. and Hook. Gen. Fl. iii. 178.*

1. **K. Bleasdalii** (after Dr. J. Bleasdale), *Benth. and Hook. Gen. Fl. iii. 178.* A small but beautiful tree (*Dallachy*), the branches, petioles and inflorescence minutely ferruginous-tomentose. Leaflets 3 to 17, petiolulate, ovate to oblong-lanceolate, acutely acuminate, somewhat undulate and irregularly mucronate-serrate, tapering or cuneate at the base, 2 to 5 in. long, penniveined and reticulate, silky-villous on both sides when very young, but glabrous and green when full-grown, rather more shining above than below, the common rhachis varying from 1 or 2 in. to above 1 ft. in length, and often irregularly winged at least between the upper leaflets, the terminal leaflet always developed and sometimes larger than the others. Racemes 1 to 2 in. long, usually several in a short panicle or solitary in the upper axils. Pedicels about 1 line long, those of each pair completely united into a single one with the two flowers obliquely sessile at or near the end. Perianth about  $3\frac{1}{2}$  lines long. Torus oblique, with one broad 2-lobed gland on the lower side sometimes almost divided into 2. Ovary glabrous, continuous with a short stipes at least as thick as the ovary.—*Grevillea Bleasdalii* or *Bleasdalea cupanoides*, F. v. M. Fragn. v. 90; *Adenostephanus Bleasdalii*, Benth. Fl. Austr. v. 417.

Hab.: Rockingham Bay, *Dallachy*.

### 10. HICKSBEACHIA, F. v. M.

(After Sir Michael Hicks-Beach.)

Flowers hermaphrodite. Perianth regular; the tube straight, the segments soon loose. Stamens inserted on the laminae. Anthers longer than the filament, almost cordate, rather shorter than the connective. Hypogynous glands 4. Style straight. Stigma nearly ellipsoid. Ovary ovate-conical. Ovules 2, pendulous, oblong, straight. Fruit ovate-roundish, indehiscent. Epicarp slightly succulent, endocarp bony. Seed solitary, ovate-globular. Testa membranous, veined. Embryo whitish, somewhat hard, even when fresh; cotyledons equal except at the faintly flexuose summit; radicle semi-ovate, basal, extremely short, not protruding beyond the cotyledons.

A tree endemic in Australia.

1. **H. pinnatifolia** (leaves pinnately lobed), *F. v. M. Wing's S. Sci. Rec. Feb.* 1882; and *Melb. Chemi. and Drug. April* 1883. A tall tree. Leaves about 2ft. long, lobes from 18 to 20, 5 to 9in. long, the lowest abbreviated, 1 to 2in. broad, green on both sides and all irregularly serrate. Racemes 7 to 13in. long, rhachis silky. Pedicels 1 to 2 lines long. Perianth-segments soon reflexed, silky outside, about  $\frac{1}{2}$ in. long. Style long as the perianth, base and ovary velvety. Fruit red, oval,  $1\frac{1}{2}$ in. long, 1in. in diameter; exocarp slightly succulent, insipid, about  $\frac{1}{4}$ in. thick; endocarp bony. Seed solitary.

Hab.: Southern scrubs.

## 11. STRANGEA, *Meissn.*

(After — Strange.)

Flowers hermaphrodite, axillary or lateral, solitary or in twos or threes at the summit of peduncles as long as the perianth or wanting. Perianth-segments 4, almost equal, tube almost straight, the laminæ soon separating and the segments recurved and deciduous. Stamens 4. Anthers almost sessile, attached below the apex of the laminæ. Hypogynous glands semiannular or almost wanting. Ovary stipitate; style soon deflexed; stigma pellate, oblique, terminal, almost lateral. Follicle 1-seeded, about  $2\frac{1}{2}$ in. long, compressed-fusiform. Exocarp almost woody, the outside striated. Endocarp free from the exocarp, but quite similar in form, chartaceous, the outer side silky, open along one edge. Seed pendulous, flat, free, about  $1\frac{1}{2}$ in. long, winged at each end and narrowly along one side.

The genus is endemic in Australia.

1. **S. linearis** (linear), *Meissn. in Hook. Kew Journ.* vii. 66, and in *DC. Prod.* xiv. 348. A small erect glabrous shrub. Leaves rather crowded, erect, linear or linear-cuneate, obtuse or mucronate, contracted at the base,  $1\frac{1}{2}$  to  $2\frac{1}{2}$ in. long, thick and veinless. Peduncles none or very short. Pedicel in the axils of the leaves either solitary or in twos and threes. Bracteoles minute, linear-lanceolate. Perianth-segments about  $2\frac{1}{2}$  lines long, broad-linear. Ovary stipes about 1 line long, glabrous; ovary bearded with reddish-brown hairs. Style glabrous,  $1\frac{1}{2}$  line long, uncinat. Follicles on recurved pedicels, fusiform, slightly compressed, thick and hard,  $1\frac{1}{2}$  to  $2\frac{1}{2}$ in. long, opening along the upper suture, 1-seeded. —Baillon. *Hist. des Plantes* i. 414; *F. v. M. Fragm.* vii. 137; *Grevillea Strangea*, Benth. *Fl. Austr.* v. 453.

Hab.: Islands of Moreton Bay and Fraser's Island.

## 12. GREVILLEA, R. Br.

(After C. F. Greville.)

(*Lysanthe* and *Stylurus*, *Salisb.*, *Anadenia*, *R. Br.*, *Manglesia*, *Endl.*)

Flowers hermaphrodite. Perianth irregular or regular, the tube revolute or curved under the limb or straight and slender, the limb globular or rarely ovoid, usually oblique, the laminæ usually cohering long after the tube has opened. Anthers all perfect, ovate, sessile in the base of the concave laminæ, the connective not produced beyond the cells. Hypogynous glands united in a single semi-annular or semi-circular gland occupying the upper (often the shortest) side of the torus or rarely completely annular surrounding the ovary, or altogether wanting. Ovary stipitate or rarely sessile, with 2 amphitropous ovules laterally attached about the middle; style filiform or somewhat dilated, usually long and protruding from the slit on the lower side of the perianth-tube before the summit is set free from the limb, ultimately straightened and erect or in a few species of *Lissostyles* and *Conogyne* remaining hooked, more or less dilated at the end into a straight oblique or lateral cone or disk bearing the small stigma in the centre of the disk

or at the summit of the cone. Fruit a follicle, usually oblique with the ventral suture curved, either coriaceous and opening along the upper margin, or rarely woody and opening almost or quite in two valves. Seeds 1 or 2, flat orbicular or oblong, bordered all round by a membranous wing, or narrowly winged at the end or outer margin only or entirely wingless.—Shrubs or trees. Leaves alternate, very diversified in shape. Flowers in pairs along the rachis of a short and umbel-like or elongated raceme, rarely reduced to a single pair; the racemes either terminal or also axillary, rarely all axillary. The indumentum usually consists of closely appressed hairs attached by the centre, rarely of erect or spreading hairs, and then usually forked at the base or clustered.

With the exception of a very few species the genus is limited to Australia.

SECT. 1. **Eugrevillea**.—*Racemes secund, and elongated, or few-flowered. Perianth-tube dilated below the middle and usually opening on the lower side, revolute under the limb. Torus small, straight or slightly oblique. Stigmatic disk lateral.*

SERIES 1. **Hebegyneæ**.—*Ovary sessile or scarcely stipitate, densely villous. Torus sometimes but very rarely slightly oblique, with the gland side the shortest.*

Leaves pinnate with linear or lanceolate segments, glabrous above, silky underneath. Perianth villous.

Leaf-segments very narrow, 4 to 8 in. long, often divided . . . . . 1. *G. chrysodendron*.

Leaf-segments few, linear lanceolate, 2 to 4 in. long . . . . . 2. *G. Banksii*.

Leaves long, lanceolate, plant prostrate. Racemes loose. Perianth-tube broad, expanding into an orbicular disk . . . . . 3. *G. eirsiiifolia*.

Leaves or leaf-lobes pungent-pointed, glabrous above or nearly so, silky underneath, cuneate with few lobes. Stipes of the ovary as long as the ovary . . . . . 4. *G. iticifolia*.  
Var. *Scortechinii*.

SECT. 2. **Ptychocarpa**.—*Racemes short, often umbel-like. Perianth-tube dilated below the middle and usually opening on the lower side, revolute under the limb. Torus small, straight or nearly so. Ovary sessile or very shortly stipitate, densely villous or rarely with only a tuft of hairs at the base. Stigmatic disk lateral. Leaves entire.*

Perianth densely villous.

Leaves ovate or oblong, mostly obtuse, the upper surface glabrous or minutely scabrous . . . . . 5. *G. floribunda*.

Leaves narrow-lanceolate or elongate-spathulate, 3 to 7 in. long, silky when young and minutely punctate . . . . . 6. *G. Helmsiæ*.

SECT. 3. **Plagiopoda**.—*Racemes various. Perianth-tube dilated below the middle and usually opening on the lower side, revolute under the limb. Torus very oblique, the gland-side the shortest. Ovary villous except in a few axillary-flowered species. Stigmatic disk very oblique or lateral.*

Racemes terminal, erect, sometimes secund. Ovary densely villous.

Style very long.

Leaves oval-elliptical or oblong-lanceolate, large, entire . . . . . 7. *G. Goodii*.

Leaves mostly above 6 in. long, simple or pinnate, with narrow-lanceolate obliquely penniveined lobes . . . . . 8. *G. venusta*.

Leaves linear, above 6 in. long, simple or pinnate, with long-linear lobes. Racemes oblong, glabrous except the ovary . . . . . 9. *G. longistyla*.

Racemes usually paniculate, viscid-villous . . . . . 10. *G. juncifolia*.

Flowers in umbels. Leaves scattered or in fascicles . . . . . 11. *G. Kennedyana*.

Racemes reduced to 1 or 2 pairs of flowers mostly axillary. Torus sometimes less oblique. Leaves entire. Leaves ovate or orbicular, small, flat. Ovary glabrous. Style long . . . . . 12. *G. singuliflora*.

SECT. 4. **Calothyrsus**.—*Racemes secund, usually many-flowered. Perianth-tube more or less dilated below the middle and usually opening on the lower side, revolute under the limb. Torus oblique, the gland side the shortest. Ovary glabrous, stipitate.*

Leaves silky-pubescent at least when young, mostly angular. Racemes axillary. Perianth bearded inside with spreading or reflexed hairs.

Perianth slightly dilated at the base as in *G. angulata* . . . . . 13. *G. Wickhami*.

Leaves mostly pinnate, the segments oblong-lanceolate, longitudinally reticulate . . . . . 14. *G. heliosperma*.

Leaves mostly pinnate, the segments oblong-lanceolate or linear, penniveined with numerous oblique parallel primary veins . . . . . 15. *G. refracta*.

Leaf-segments numerous, linear, obscurely veined above, 1-nerved underneath. Racemes long. Perianth above 3 in. long . . . . . 16. *G. Dryandri*.

Leaves undivided, narrow-linear, very long, thinly-silky underneath.

Racemes only a few inches long. Perianth 2 to 3 lines long . . . 17. *G. stenobotrya*.

Leaf-segments not numerous, linear or lanceolate, obscurely veined above,

1-nerved underneath. Racemes dense. Perianth under  $\frac{1}{2}$  in. long . . . 18. *G. polystachya*.

Leaves mostly bipinnatifid with lanceolate lobes or segments . . . 19. *G. robusta*.

SECT. 5. **Cycloptera**.—*Racemes dense, usually paniculate. Flowers small. Perianth-tube narrow, recurved or reflexed under the limb. Torus straight. Ovary glabrous, stipitate. Fruit usually broad. Seeds winged all round. Tropical or subtropical species.*

Leaves longitudinally veined.

Leaves undivided, very long, with 9 to 13 closely parallel veins . . . 20. *G. striata*.

Leaves undivided, falcate, longitudinally reticulate and irregularly several-veined . . . 21. *G. mimosoides*.

Leaves large, penniveined, ovate-lanceolate or oblong on old plants.

Leaves entire or deeply pinnatifid, rather thin, glabrous above, silvery-silky underneath . . . 22. *G. Hilliana*.

Leaves on young trees, often 1 ft. to 1½ ft. long, the lobes often narrow-linear, rusty-brown on the underside, upper side greyish-green . . . 23. *G. pinnatifida*.

Leaves rather thick, entire, minutely pubescent on both sides . . . 24. *G. gibbosa*.

SECT. 6. **Lissostylis**.—*Racemes short and dense. Perianth-tube narrow, revolute or recurved under the limb. Torus straight. Ovary glabrous, stipitate. Stigmatic disk very oblique or lateral.*

SERIES I. **Sericeæ**.—*Flowers numerous in a short dense raceme. Perianth-tube under 4 lines long. Leaves entire. Fruit usually smooth.*

Leaves oblong-lanceolate or linear, flat, green on both sides . . . 25. *G. leiophylla*.

1. **G. chrysodendron** (golden tree), *R. Br. in Trans. Linn. Soc. x. 176, Prod. 379; Benth. Fl. Austr. v. 434. "Abergubber," St. George, Wedd.* A tree of 15 ft. to 20 ft., the young branches tomentose. Leaves pinnate with numerous very narrow linear segments of 4 to 8 in., the lower ones sometimes forked, the rhachis angular 6 in. to 1 ft. long, the segments silky underneath, becoming glabrous above, rarely rather broader and veined, the margins revolute. Racemes erect, terminal or in the upper axils rather dense, secund, 3 to 5 in. long. Flowers yellow. Pedicels 1 to 2 lines long, tomentose-villous as well as the rhachis. Perianth pubescent or villous outside, glabrous inside, the tube not broad, scarcely 3 lines long, slightly contracted and much revolute under the globular limb. Torus straight. Glands almost or quite divided into two, broad and short. Ovary sessile, villous; style long, the stigmatic disk oblique or lateral with a prominent central umbo. Fruit obliquely ovate-oblong, compressed, about  $\frac{3}{4}$  in. long. Seedwing surrounding the nucleus, but narrow. —Meissn. in DC. Prod. xiv. 383; *G. pteridifolia*, Knight, Prot. 121; *G. Mitchellii*, Hook. in Mitch. Trop. Austral. 265; Meissn. l.c.

Hab.: Islands of the Gulf of Carpentaria, Endeavour River, *R. Brown*; Rockingham Bay, *Dallachy*; Mistake Creek, *Fitzalan*; Cape River, *Bowman*; Brigalow scrub on the Belyando, *Mitchell*.

2. **G. Banksii** (after Sir J. Banks), *R. Br. in Trans. Linn. Soc. x. 176, Prod. 379; Benth. Fl. Austr. v. 434.* A tall shrub or slender tree of 15 to 20 ft., the branches and inflorescence softly ferruginous-tomentose. Leaves deeply pinnatifid or pinnate with 8 to 11 broadly linear or lanceolate segments, obtuse or mucronate, with recurved margins, 2 to 4 in. long, glabrous above, silky-ferruginous underneath, the midrib alone prominent or obscurely penniveined, the whole leaf 4 to 8 in. long, and here and there a small leaf undivided. Racemes terminal, erect, dense, secund, 2 to 4 in. long, solitary or 2 or 3 on a terminal leafless peduncle. Flowers red, greenish or almost white. Pedicels 3 to 4 lines long, tomentose as well as the rhachis. Perianth tomentose outside, glabrous inside, the tube not very broad, 6 or 7 lines long, contracted and revolute under the limb. Torus straight or nearly so. Gland prominent, semiannular, more or less lobed or jagged. Ovary sessile, densely villous; style long and



glabrous, clavate under the very oblique or lateral convex stigmatic disk. Fruit obliquely ovate, compressed, almost acute, about 1 in. long.—Meissn. in DC. xiv. 375; Bauer, Illustr. t. 9; Bot. Mag. 5870.

Hab.: Broadsound, Keppel and Shoalwater Bays, *R. Brown*; open barren hills, Upper Brisbane River, *A. Cunningham*; Rockhampton, *Thozet*; head of Cape River, *Bowman*; Wide Bay, *Bidwill*; Keppel Bay, *O'Shanesy*; mouth of Fitzroy River, *C. Haynes*; Facing Island, *W. Hill*.

3. **G. cirsiifolia** (Cirsium-leaved), *Meissn. in Pl. Preiss. ii. 253, and in DC. Prod. xiv. 376; Benth. Fl. Austr. v. 436*. Stems prostrate, not much branched, silky-tomentose. Leaves linear or lanceolate, 3 to 6 in. long, entire or remotely toothed or pinnatifid, the teeth or lobes short and falcate or rarely longer and lanceolate, glabrous above when full grown, silky beneath. Racemes lateral or axillary, loose, secund, shortly pedunculate, 2 to 3 in. long, the rhachis pedicels and perianths silky and often fulvous. Bracts small, often persistent. Pedicels  $1\frac{1}{2}$  to 3 lines long. Perianth glabrous inside, the tube scarcely dilated at the base, revolute above the middle and the 2 lower segments there dilated into broad semi-orbicular horizontally-spreading appendages, forming a broad disk, entirely concealing the revolute-globular limb. Torus straight. Gland obsolete. Ovary sessile or nearly so, densely villous with long fulvous hairs; style glabrous, thick but flattened; stigmatic disk lateral, thick, the stigma on a prominent central point. Fruit very oblique, ovoid, about 4 lines long.

Hab.: Summit of Mount Lindsay, *C. Moore*.

4. **G. ilicifolia** (Holly-leaved), *R. Br. Prot. Nov. 21; Benth. Fl. Austr. v. 437*. A large spreading shrub attaining 6 ft. or more though often much smaller, the branches more or less silky or hoary-pubescent. Leaves in the typical form cuneate, undulate prickly-toothed and lobed at the end with a long tapering base, the whole leaf 1 to 2 in. long, but sometimes longer and deeply pinnatifid with narrow lobes, more rarely pinnatifid with short lobes from near the base almost as in *G. aquifolium*, or as broad as long and once or twice 3-lobed, the lobes or teeth always rigid and pungent-pointed, glabrous and veined above, more or less silky underneath. Racemes terminal, secund, 1 to 2 in. long, the rhachis and pedicels silky-pubescent or villous. Pedicels about 1 line long. Bracts sometimes persistent. Perianth villous outside, glabrous inside, the tube about 4 lines long, revolute under the limb. Torus nearly straight. Ovary stipitate, villous; style long, glabrous; stigmatic disk oblique. Fruit oblique, acuminate, about  $\frac{1}{2}$  in. long.—Meissn. in DC. Prod. xiv. 377; *Anadenia ilicifolia*, *R. Br. in Trans. Linn. Soc. x. 167, Prod. 375; G. Behrii*, Schlecht. in Linnæa, xx. 585.

The Queensland plant is the var. *Scortechinii* (after the Rev. B. Scortechini), *Bail. Syn. Ql. Fl. 435*.—A procumbent or prostrate plant. Leaves  $1\frac{1}{2}$  to 2 in. long, the upper portion shortly 3 to 5 lobed, the lobes ending in sharp teeth, upper side glabrous, underside silvery. Flowers purple. Stigmatic-disk umbonate. Fruit marked with several broad dark lines. Seeds oblong, not winged.

Hab.: Stanthorpe, *Rev. B. Scortechini*.

5. **G. floribunda** (flowery), *R. Br. Prot. Nov. 19; Benth. Fl. Austr. v. 440*. An erect or spreading shrub not exceeding 5 ft., the branches ferruginous-tomentose. Leaves nearly sessile, oval or oblong, obtuse or with a small callous point, the margins recurved or revolute,  $\frac{3}{4}$  to nearly 2 in. long, villous when young, minutely scabrous above and silky-tomentose underneath when full-grown, sometimes faintly penniveined. Racemes terminal, sessile or shortly pedunculate and often 1 in. long, the rhachis and flowers very densely villous with ferruginous hairs. Pedicels 1 to 2 lines long. Perianth bearded inside about the middle, the tube from about 3 lines to above 4 lines long, broad and gibbous at the base, attenuate and much revolute above the middle, the limb globular and obtuse. Torus nearly straight, gland horizontal, broad, not very prominent. Ovary

sessile, densely villous; style not very long, villous, thick; stigmatic disk lateral. Fruit about  $\frac{1}{2}$  in. long, slightly ribbed.—Meissn. in DC. Prod. xiv. 361; *G. sphacelata*, A. Cunn. Herb.; *G. autumnalis*, Lhotzk. MSS. (Meissner); *G. chrysophuca*, F. v. M. First Gen. Rep. 17; Meissn. in Linnæa, xxvi. 357, and in DC. Prod. xiv. 361; *G. ferruginea*, Grah. in Maund, Botanist, t. 153, not of Sieber.

Hab.: St. George, J. Wedd.

6. **G. Helmsiæ** (after Mrs. R. Helms), *Bail. Ql. Agri. Journ.* iv. 195, *Plates* lxxxix. and xc. A small tree with a somewhat rough bark; branches nearly terete, more or less clothed with a thin grey tomentum, the young growth almost strigose. Leaves narrow-lanceolate or elongate-spathulate, 3 to 7 in. long, seldom exceeding  $\frac{3}{4}$  in. broad, tapering at the base, but scarcely forming a distinct petiole, of a greyish-colour; the upper side glossy, silky-hairy when young, minutely punctate, underside pale from a thin scurfiness; primary lateral nerves numerous, erecto-patent, the lowermost ones sometimes looping within the margin; margins entire or sometimes the longer leaves showing a few distant indentations in the upper portion, apex ending in a small dark gland (leaves on adventitious shoots from the trunk longer and narrower than the others). Racemes near the ends of the branchlets, almost sessile, seldom much exceeding 1 in.; flowers very dense, of a spicy fragrance. Pedicels slender, about 3-lines long, silky-hairy as well as the rhachis. Perianth long as the pedicel, silky-hairy outside, the inside with long white hairs, except at the base, where the tube is glabrous; opening to near the base, and very revolute. Gland semi-annular. Ovary on a stipes of about 1 line, which is glabrous, as well as the ovary and style; the latter much curved, about 7 lines long. Stigmatic disk oblique, oval, convex. Fruit ovate-oblong, mucronate from the persistent base of the style, nearly 1 in. long,  $\frac{1}{2}$  in. broad, valves woody. Seeds 2, greyish-brown, surrounded by a narrow-wing, about 10 lines long, 5 lines broad, including the wing.

Hab.: Childers, Mrs. R. Helms; who also furnished drawing from which the above plates were produced.

7. **G. Goodii** (after Peter Good), *R. Br. in Trans. Linn. Soc.* x. 174, *Prod.* 379; *Benth. Fl. Austr.* v. 446. Stems prostrate, diffuse (or sometimes erect?), the young branches minutely tomentose. Leaves petiolate, oval-elliptical to oblong-lanceolate, obtuse, rounded or cuneate at the base, 3 to 8 in. long, glabrous or the under surface minutely silky, of a pale colour, pinniveined with numerous primary veins uniting in an intramarginal nerve and minor reticulations conspicuous on both sides. Racemes terminal, solitary or 2 or 3 together, pedunculate, secund, the rhachis  $1\frac{1}{2}$  to 2 in. long. Pedicels 2 to 3 lines long, minutely tomentose as well as the rhachis. Perianth 6 to 8 lines long, nearly glabrous outside, bearded inside with reflexed hairs, the tube obliquely dilated at the base, attenuate above the middle and revolute under the obliquely globular depressed limb. Torus very oblique, linear, about 3 lines long. Gland horseshoe-shaped, slightly prominent. Ovary villous with long hairs, stipitate on the upper margin of the torus; style very long, more or less ciliate; stigmatic disk broad, lateral.—Meissn. in DC. Prod. xiv. 351; Guillem. Ic. Pl. Austral. t. 16.

Hab.: Sandstone country, head of Cape and Flinders River, *Bowman*; Alice, Centr. Rail. T. H. Girling.

8. **G. venusta** (graceful), *R. Br. in Trans. Linn. Soc.* x. 175, *Prod.* 379; *Benth. Fl. Austr.* v. 446. A tall shrub or small tree, the young branches and inflorescence ferruginous-tomentose. Leaves simple or deeply pinnatifid, with 3 to 7 long narrow-lanceolate lobes, the whole leaf 4 to 8 in. long, glabrous and pinniveined with numerous oblique parallel veins not very close, often confluent in an intramarginal nerve, minutely silky-tomentose underneath with the ferruginous veins. Racemes terminal, rather loose and short. Perianth sprinkled with

appressed hairs, the tube about 5 lines long, very obliquely dilated at the base, attenuate and revolute above the middle. Torus very oblique, narrow, 2 lines long. Gland horseshoe-shaped. Ovary densely villous, stipitate on the upper margin of the torus; style long, nearly glabrous; stigmatic disk lateral.—Meissn. in DC. Prod. xiv. 351; Guillem. lc. Pl. Austral. t. 11.

Hab.: Shoalwater Bay, *R. Brown*.

9. *G. longistyla* (long-style), *Hook. in Mitch. Trop. Austr.* 343; *Benth. Fl. Austr.* v. 446. An erect shrub of 7 or 8 ft., the young branches minutely tomentose. Leaves linear, 6 to 10 in. long, from very narrow to above 2 lines broad, entire or deeply divided into 3 to 5 segments, glabrous above, the margins recurved, silky pubescent and silvery or fulvous underneath with a prominent midrib. Racemes erect, shortly pedunculate, terminal, or in the upper axils, rather loose, secund, 1 to 2 in. long. Pedicels 2 to 4 lines long, tomentose-pubescent and apparently viscid as well as the rhachis. Torus very oblique. Gland large, disk-shaped or almost horseshoe-shaped. Ovary densely but shortly villous, on a short stipes at the upper end of the torus; style very long, glabrous, thickened under the broad lateral stigmatic disk. Fruit hard, semiglobular, about  $\frac{1}{2}$  in. long. Seed scarcely winged.—Meissn. in DC. Prod. xiv. 351; *G. neglecta*, *R. Br. App. Sturt Exped.* 24; Meissn. l.c.

Hab.: Sandstone Ranges near Mount Pluto and the Pyramids, *Mitchell*; Burnett Ranges, *F. v. Mueller*; Boyd's River, *Leichhardt*; Flinders River, *Sutherland*.

The pinnate-leaved specimens on which *G. neglecta* was founded, cannot be distinguished as a variety from the simple-leaved ones, as both forms occur frequently on the same branch.—*Benth.*

10. *G. juncifolia* (rush-like leaves), *Hook. in Mitch. Trop. Austr.* 341; *Benth. Fl. Austr.* v. 447. A tall erect shrub, the branches softly tomentose. Leaves very narrow-linear, 6 to 10 in. long, entire or here and there divided into 2 or 3 similar segments, rigid and rather thick, doubly grooved underneath and sometimes obscurely so above, glabrous or minutely pubescent. Racemes rather loose, secund, 3 to 6 in. long, usually several together in a terminal leafy panicle. Pedicels about  $\frac{1}{2}$  in. long, viscid-pubescent as well as the rhachis. Perianth yellow, slightly pubescent and apparently viscid outside, glabrous inside, the tube broad at the base, 4 or 5 lines long, much attenuate and revolute under the obliquely globular limb, the lobes with a horn-like dorsal appendage. Torus oblique. Gland broad, semicircular. Ovary villous, almost sessile on the upper margin of the torus; style very long, slightly thickened upwards; stigmatic disk lateral, convex or umbonate. Fruit very oblique, almost transverse, nearly 1 in. long. Seed broadly winged all round.—Meissn. in DC. Prod. xiv. 351; *G. Sturtii*, *R. Br. App. Sturt Exped.* 23; Meissn. l.c. 383, from the character given.

Hab.: Near Mount Pluto, *Mitchell*.

This and the preceding species approach in habit *G. chrysodendron* and *G. Banksii*, but are at once distinguished by the oblique torus.—*Benth.*

11. *G. Kennedyana* (after Mrs. M. B. Kennedy, of Wonnaminta), *F. v. M. Proc. Roy. Soc. Vict.* xxiv. 172. A shrub of about 5 ft., more or less covered with short, appressed, greyish hairs. Leaves scattered or somewhat fascicled, rigid, linear, entire, pungently pointed, margins revolute, from 8 to 12 lines long, with a single groove underneath. Flowers in sessile umbels, terminal or axillary, very numerous; bracts fugacious; pedicels glabrous,  $\frac{1}{4}$  in. long. Perianth-segments near 1 in. long, bright red, reflexed in the upper half, glabrous outside, the inside beset with whitish hairs; torus elongated, almost in a straight line continuing the pedicel. Hypogynous gland semi-annular and also upwards protracted; style glabrous, nearly half exserted; ovary stipitate, stigma lateral. Fruit oblique-ellipsoid, pointed at the upper end, slightly glandular-rough outside, 8 lines long. Seeds linear or narrow-ellipsoid, channelled, greyish outside, with a short pale terminal appendage.

Hab.: Given as a Queensland plant in *Muell. 2nd Syst. Cens. Austr. Pl.* 118.

12. ***G. singuliflora*** (singular-flowered), *F. v. M. Fragm.* vi. 92; *Benth. Fl. Austr.* v. 452. A densely branched glabrous shrub, probably small. Leaves sessile or very shortly petiolate, broadly ovate or orbicular, very obtuse, flat or undulate, with a nerve-like margin, 4 to 6 lines long, faintly penniveined on both sides. Pedicels in pairs in the upper axils, filiform, glabrous, 3 to 4 lines long. Perianth glabrous outside, slightly pubescent inside about the middle, the tube gibbous at the base on the upper side, about 4 lines long, revolute under the globular limb. Torus very oblique, linear, about 2 lines long. Gland small and horseshoe-shaped at the lower end. Ovary glabrous on a long stipes at the upper end of the torus; style rather long; stigmatic disk lateral.

Hab.: Dogwood Creek, *Leichhardt*.

13. ***G. Wickhami*** (after Capt. Wickham, R.N.), *Meissn. in DC. Prod.* xiv. 380; *Benth. Fl. Austr.* v. 455. A shrub of 4 to 6 ft. or a small tree, the young branches and foliage minutely silky-pubescent, the older leaves nearly glabrous. Leaves petiolate, ovate, angular or sinuate, with prickly-pointed angles or teeth, cuneate at the base, 1 to 1½ in. long, reticulate as in *G. angulata*, or thicker with the reticulations less conspicuous. Racemes secund,  $\frac{3}{4}$  to 2 in. long, on short axillary peduncles or terminating short branches. Pedicels 1 to 2 lines long, glabrous as well as the rhachis. Perianth glabrous outside, bearded inside about the middle, the tube scarcely 3 lines long, broad and very oblique at the base, contracted and much revolute under the globular limb. Torus oblique. Gland horseshoe-shaped, large but not very prominent. Ovary glabrous, stipitate on the upper margin of the torus; style glabrous or minutely papillose-pubescent, with a large lateral stigmatic disk. Fruit very obtuse, 4 to 5 lines long.

Hab.: Gulf of Carpentaria, *F. v. M.*

14. ***G. heliosperma*** (referring to the round seed), *R. Br. in Trans. Linn. Soc.* x. 176, *Prod.* 380; *Benth. Fl. Austr.* v. 457. A small slender tree, the young shoots minutely silvery or fulvous-pubescent, the adult foliage glabrous and more or less glaucous. Leaves once or twice pinnate, the segments not very numerous, oblong-lanceolate, obtuse, flat, 3 to 4 in. long, tapering at the base and often petiolulate, triplinerved or penniveined with few almost longitudinal primary veins and numerous almost longitudinal reticulations conspicuous on both sides, the whole leaf 6 in. to 1 ft. long. Racemes very loose, secund, 2 to 4 in. long, terminal or lateral, often branched but shorter than the leaves. Perianth glabrous outside as well as the whole inflorescence, bearded inside below the middle, the tube fully 4 lines long, dilated towards the base, somewhat contracted upwards and much revolute under the obliquely globular limb. Torus very oblique and narrow, 3 lines long. Gland adnate, scarcely prominent. Ovary glabrous, stipitate at the upper end of the torus; style very long; stigmatic disk very oblique or lateral, very convex. Fruit nearly globular, oblique, 1 in. diameter, with very thick hard valves. Seed broadly winged all round.—*Meissn. in DC. Prod.* xiv. 380.

Hab.: Westmoreland, Burketown, *J. B. Mackintosh*.

15. ***G. refracta*** (broken), *R. Br. in Trans. Linn. Soc.* x. 176, *Prod.* 380; *Benth. Fl. Austr.* v. 458. A tall shrub or small tree, the young branches tomentose. Leaves mostly pinnate with 3 to 11 segments 2 to 5 in. long, linear-lanceolate or the terminal one broader, or sometimes reduced to a single oblong-cuneate leaf, the segments acute or obtuse when broad, tapering at the base and sometimes petiolulate, the margins usually recurved, nearly glabrous above and penniveined with numerous very oblique and nearly parallel primary veins, densely silky-pubescent underneath with the midrib alone prominent. Racemes short, secund, nearly sessile, usually several together in a small sessile terminal panicle, the rhachis of each raceme rarely above 1 in. long, the pedicels 2 to

3 lines, hoary-tomentose. Perianth silky-pubescent outside, bearded inside about the middle, the tube 4 to 5 lines long, dilated towards the base, contracted upwards and much revolute under the obliquely globular limb. Torus very oblique. Gland very prominent, half-cup shaped, 2-lobed. Ovary glabrous, stipitate on the upper margin of the torus; style thick, not very long; stigmatic disk lateral. Fruit very hard, nearly globular, about 1in. diameter. Seed broadly winged.—Meissn. in DC. Prod. xiv. 382.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

Var. *ceratophylla*. Leaf-segments often rather broader and several of the leaves undivided. the primary veins more conspicuous underneath — *G. ceratophylla*, *R. Br.* in Trans. Linn. Soc. x. 177, Prod. 380; Meissn. in DC. Prod. xiv. 382; *G. heterophylla*, *A. Cunn.* in *R. Br. Prot.* Nov. 24; Meissn. l.c. 381.—Islands of the Gulf of Carpentaria, *R. Brown*.

16. **G. Dryandri** (after J. Dryander), *R. Br. in Trans. Linn. Soc.* x. 175, Prod. 379; *Benth. Fl. Austr.* v. 458. A tall shrub, the branches minutely hoary-tomentose, or quite glabrous. Leaves pinnate, with numerous narrow-linear rather rigid mucronate segments, the lower ones 2 to 4in. long, the upper ones gradually smaller, all with recurved or revolute margins, glabrous above and more or less marked with very oblique or longitudinal veins, silky-pubescent underneath with the midrib prominent. Racemes loose and secund, glabrous and glaucous, from 4 or 5in. to nearly 1ft. long, and often several on a long stout terminal peduncle. Pedicels 3 to 5 lines long. Perianth white, glabrous outside, slightly bearded inside, the tube 7 to 9 lines long, dilated at the base, attenuate from the middle and revolute under the obliquely globular limb, the laminæ of the longer segments bearing a longitudinal dorsal keel-like appendage. Torus oblique but not very much so. Gland prominent, semiannular, often 2-lobed. Ovary glabrous, on a long stipes; style very long; stigmatic disk lateral.—Meissn. in DC. Prod. xiv. 374; *G. rigens*, *A. Cunn.*; Meissn. l.c.; *G. callipteris*, Meissn. l.c. 375.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*, *Henne*; Cape Flinders, *A. Cunningham*.

17. **G. stenobotrya** (slender bunches), *F. v. M. Fragm.* ix. 3. A sturdy plant, the branches becoming glabrous. Leaves 9 or more in. long, undivided, narrow-linear, little more than 1 line broad, margins shortly revolute, the under side slightly silky. The racemose panicles only a few in. long; bracts caducous. Pedicels scarcely  $1\frac{1}{2}$  line long. Perianth minute whitish and very slightly pilose outside, segments 2 to 3 lines long, revolute. Hypogynous gland unilateral, very short. Ovary turgid, shortly stipitate, glabrous. Style scarcely 3 lines long, glabrous, stigma dilated almost lateral.

Hab.: Recorded for Queensland by *F. v. M.*

18. **G. polystachya** (many spiked panicle), *R. Br. in Trans. Linn. Soc.* x. 177, Prod. 380; *Benth. Fl. Austr.* v. 459. A tall shrub or small tree, attaining about 30ft., the branches minutely silky-pubescent or hoary when young. Leaves linear or linear-lanceolate and undivided, or dilated upwards and irregularly divided into 2 to 6 long linear-lanceolate segments, the whole leaf 6 to 10in. long, acuminate, tapering into a petiole, glabrous above, more or less silky-pubescent underneath, with the midrib and often longitudinal lateral veins prominent. Racemes rather dense, secund, 3 to 4in. long, glabrous, usually several in a short terminal panicle. Pedicels 1 to 2 lines long. Perianth white, glabrous outside, shortly bearded inside, the tube about 4 lines long, not much dilated at the base, narrow and revolute under the globular limb. Torus oblique but not very much so. Gland semicircular. Ovary glabrous, stipitate; style rather long, shortly thickened under the very oblique stigmatic disk. Fruit woody, obliquely orbicular,  $\frac{3}{4}$  to 1in. diameter. Seeds broadly

winged.—Meissn. in DC. Prod. xiv. 384; *C. parallela*, Knight, Prot. 121; *G. polybotrya*, F. v. M. in Hook. Kew Journ. ix. 23; Meissn. l.c. 698, not of Meissn. l.c. 386.

Hab.: Shoalbay Passage, *R. Brown*; Gilbert River, *F. v. Mueller*; Edgecombe and Rockingham Bays, *Dallachy*; Port Denison, *Fitzalan*; Broadsound, Flinders and Bowen Rivers, *Bowman*; Liverpool River, *Gulliver*; Port Mackay, *Nerust*.

Wood red, hard, close-grained and durable, prettily marked; suitable for cabinet-work.—*Bailey's Cat. Ql. Woods*, No. 335a.

Var. *hebestachya*. Racemes minutely hoary-pubescent. Flowers rather smaller.—*Cape York*, *Daemel*; Dayman's Island, *W. Hill*. Some of the Rockingham Bay specimens are intermediate between these and the typical form.—*Benth*.

*G. angustata*, R. Br. Prod. Nov. 24; Meissn. in DC. Prod. xiv. 384, described from specimens in leaf only from Cape Cleveland, *A. Cunningham*, is probably only a very narrow leaved form of *G. polystachya*.—*Benth*.

19. ***G. robusta*** (robust), *A. Cunn. in R. Br. Prot. Nov. 24; Benth. Fl. Austr. v. 459*. "Tuggan Tuggan," Brisbane, *Pettigrew*. "Koomkabang," Bundaberg, *Keys*. Silky Oak, of S. Queensland. A tree sometimes small and slender, sometimes robust and 80 to 100ft. high, the young branches hoary or ferruginous-tomentose. Leaves pinnate with about 11 to 21 pinnatifid pinnae, the secondary lobes or segments entire or again lobed, lanceolate or rarely linear, often above 1in. long, the margins recurved, glabrous above or sprinkled with appressed hairs and obscurely veined; silky underneath, the whole leaf 6 to 8in. long and nearly as broad. Racemes secund, 3 or 4in. long, solitary or several together on very short leafless branches on the old wood. Pedicels slender, about  $\frac{1}{2}$ in. long, glabrous as well as the rhachis. Perianth glabrous outside and in, the tube nearly 3 lines long, scarcely dilated at the base, revolute under the ovoid limb. Torus slightly oblique. Gland prominent, semiannular. Ovary glabrous, stipitate; style long, the stigmatic disk somewhat oblique with a central cone. Fruit broad, very oblique, 8 or 9 lines long. Seed winged all round.—Meissn. in DC. Prod. xiv. 381; Bot. Mag. t. 3184; *G. umbratica*, *A. Cunn.*; Meissn. l.c.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *Fraser*; many southern localities.

Exudes a gum which may be used as a substitute for gum arabic.—*Lauterer*.

Wood of a light-pinkish colour; used for staves and in cabinet-work.—*Bailey's Cat. Ql. Woods*, No. 336.

20. ***G. striata*** (channelled), *R. Br. in Trans. Linn. Soc. x. 177, Prod. 380; Benth. Fl. Austr. v. 462*. "Willer," St. George, *Wedd*. "Ar-roo-in," Princess Charlotte Bay. "Arrongg," Palmer River, *Roth*. A small or large tree, the branches closely tomentose, the foliage minutely and sometimes sparingly silky-pubescent. Leaves undivided, linear or linear-lanceolate, 6 to 18in. long, often curved, 2 to 5 lines broad, obscurely-veined above, striate underneath, with 9 to 13 raised parallel nerves, separated by intervals much narrower than the nerves themselves. Flowers small, in slender spike-like erect racemes of 2 or 3in., shortly pedunculate and usually several together in a leafless panicle shorter than the leaves, the rhachis tomentose. Pedicels scarcely 1 line long. Perianth silky-pubescent outside, glabrous inside, the tube about 2 lines long, narrow, revolute under the globular limb. Torus small. Gland semiannular, prominent. Ovary glabrous on a slender stipes; style not very long, the stigmatic cone straight. Fruit broad, very oblique, compressed, about  $\frac{1}{2}$ in. long.—Meissn. in DC. Prod. xiv. 385; *G. lineata*, R. Br. App. Sturt. Exped. 24; Meissn. l.c.

Hab.: Islands of Gulf of Carpentaria, *R. Brown*; Wide Bay, *Bidwill*; Port Denison, *Fitzalan*; Kennedy District, *Daintree*; Flinders and Dawson Rivers, *Sutherland*; in the interior, *Mitchell*.

Blacks consider the gum the best for their cement. Charcoal used for stuffing up spear wounds on chest.—*Roth*.

The resin of this tree may be used medicinally as a substitute for pitch, and even technically where toughness and stickiness is not required.—*Lauterer*.

Wood dark brown, nicely marked, strong, close-grained; useful for staves and cabinet-work.—*Bailey's Cat. Ql. Woods*, No. 337.







21. **G. mimosoides** (Mimosa-like), *R. Br. in Trans. Linn. Soc. x. 177, Prod. 380, Prot. Nov. 25; Benth. Fl. Austr. v. 462.* A tree, quite glabrous, but the foliage glaucous. Leaves undivided, lanceolate, falcate, 6 to 10 in. long, varying from under  $\frac{1}{2}$  in. to above 1 in. in breadth, obtuse or with a callous point, tapering into a short petiole, flat, with several, sometimes many longitudinal veins or nerves, and very oblique almost longitudinal veinlets visible on both sides, but not very prominent. Flowers small, pinkish-white, in slender glabrous racemes of 3 or 4 in., shortly pedunculate, and usually several in a terminal leafless panicle. Pedicels  $\frac{1}{2}$  to 1 in. long. Perianth glabrous, the tube narrow, about 2 lines long, revolute under the globular limb. Torus small. Disk semiannular, scarcely prominent or very obscure. Ovary glabrous, on a long stipes; style long, with a short nearly straight stigmatic cone or conical disk. Fruit broad, very oblique, somewhat compressed, fully 1 in. long. Seed wing narrow, coriaceous.—Meissn. in DC. Prod. xiv. 385.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown.*

22. **G. Hilliana** (after Walter Hill), *F. v. M. in Trans. Phil. Inst. Vict. ii. 72; Benth. Fl. Austr. v. 463.* A large tree, the young branches minutely-tomentose. Leaves petiolate, either entire obovate-oblong or elliptical, very obtuse, tapering at the base and 6 to 8 in. long, or still longer and deeply divided at the end into 2 or 3 diverging lobes, or deeply pinnatifid with 5 to 7 oblong or lanceolate lobes of several inches, the whole leaf then sometimes above 1 ft. long, glabrous above penniveined and reticulate with the primary veins confluent in an intermarginal nerve, more or less silvery-silky underneath. Flowers small and very numerous in dense cylindrical racemes of 4 to 8 in., on short axillary shoots accompanied often by 1 or 2 smaller racemes. Pedicels about 1 line long, minutely pubescent as well as the rhachis. Perianth minutely silky outside, glabrous or scarcely pubescent inside, the tube slender, about 3 lines long, revolute under the globular limb. Torus straight. Gland semiannular, not very prominent. Ovary glabrous, stipitate; style long and slender, the stigmatic disk lateral. Fruit slightly compressed, nearly 1 in. long. Seed rather narrowly winged all round.

Hab.: Brisbane River; Rockingham Bay, *Dallachy*; Logan and Albert Rivers, *Hill.*

Wood dark-brown, close-grained, and prettily marked.—*Bailey's Cat. Ql. Woods, No. 338.*

23. **G. pinnatifida** (pinnately cleft), *Papers on Ql. pl. i. 6, and 2nd Suppl. Syn. Ql. Fl. 52; Bail.* A very handsome erect tree of medium size, the smaller branches angular and velvety, with rusty brown hairs. Leaves alternate, entire or pinnatifid, those of the barren shoots and young plants often exceeding 18 in. in length, divided nearly to the midrib into from 2 to 4 pairs of opposite, long, narrow-linear, attenuated, somewhat approximate lobes about 1 in. broad, with or without a terminal odd lobe, the base decurrent on the petiole; the upper surface of a greyish-green, the under-surface bright rusty-brown, prominently reticulate, the lateral oblique primary veins joining in an intramarginal one some distance from the edge of the leaf. The leaves near the inflorescence simple and lanceolate, about 6 in. long. Inflorescence silky-white in a terminal panicle of raceme-like branches 3 to 5 in. long, bearing pedicellate flowers, scattered solitary or in clusters of 2 or more. Bracts linear, 2 or 3 lines long, very deciduous. Perianth silky, glabrous inside, about 3 or 4 lines long, the segments very narrow, the limb globose; ovary stipitate, glabrous; style filiform; stigmatic disk lateral and somewhat dilated; hypogynous gland broad. Fruit an oblong coriaceous follicle, pendulous on the rhachis, about 7 lines long and 4 lines broad, slightly compressed, bearing the straight persistent style. Seeds 2, bordered all round by a membranous wing.—*Kermadecia pinnatifida*, *Bail., Ql. Woods, No. 332A.* Colonial and Indian Exhibition.

Hab.: Johnstone River.—*T. L. Bancroft.*

Wood of a pinkish colour, close in grain, and very prettily marked; useful to coopers and cabinet-makers.—*Bailey's Cat. Ql. Woods, No. 332A.*

24. **G. gibbosa** (swollen), *R. Br. in Trans. Linn. Soc.* x. 177, *Prod.* 380; *Benth. Fl. Austr.* v. 463. A small or large tree sometimes reduced to a tall shrub, the branches and foliage softly tomentose-pubescent with very short hairs silky on the young shoots and persisting on both sides of the adult leaves. Leaves entire, ovate ovate-lanceolate or oblong-elliptical, obtuse or almost acute, tapering into a short petiole, 3 to 4 or rarely 5 in. long, penniveined with rather numerous oblique primary veins confluent in an intermarginal nerve. Flowers small, in dense spike-like racemes of 3 to 6 in., shortly pedunculate and usually 3 together at the ends of the branches. Pedicels 1 to 1½ line long, pubescent as well as the rachis. Perianth sprinkled or clothed with appressed hairs outside, glabrous inside, the tube slender, about 2 lines long, revolute under the globular limb. Torus small. Gland very prominent, semi-cupular, truncate or 2-lobed. Ovary glabrous, shortly stipitate; style long, filiform, the stigmatic cone straight or nearly so. Fruit obliquely globular, 1 to 1½ in. diameter, opening in 2 very hard thick hemispherical valves, enclosing 1 or 2 flat broadly winged seeds.—*Meissn. in DC. Prod.* xiv. 385; *G. glauca*, Knight, *Prot.* 121.

Hab.: Endeavour River, *Banks and Solander, W. Hill*; Cape York, *McGillivray, Daemel*; Albany Island, *F. v. Mueller, W. Hill*; Suttor, Cape, and Burdekin Rivers, *Leichhardt, F. v. Mueller, Bowman*, and others.

Wood dark-brown, prettily marked, close-grained and hard; of a greasy nature which prevents it shining when polished.—*Bailey's Cat. Ql. Woods*, No. 339.

25. **G. leiophylla** (leaves smooth), *F. v. M.*; *Benth. Fl. Austr.* v. 471. Stems slender, branching erect procumbent or from a thick rhizome, often scarcely above 1 ft. high, the whole plant except the inflorescence glabrous or sprinkled with a few rare appressed hairs. Leaves linear or linear-lanceolate, mucronate-acute, shortly contracted at the base, 1 to near 2 in. long, with recurved or revolute margins or quite flat, green on both sides, veinless except the prominent midrib. Flowers small, in short dense somewhat secund racemes, sessile or pedunculate at the ends of the branches or in the upper axils. Pedicels 1 to 2 lines long. Perianth bearded inside above the middle.

Hab.: Glasshouse Ranges, Moreton Bay, *F. v. Mueller*; coastal localities in the south.

### 13. HAKEA, Schrad.

(After Baron Hake.)

(*Conchium, Sm.*)

Flowers hermaphrodite. Perianth irregular or rarely regular, the tube revolute or curved under the limb or rarely straight, the limb globular or rarely ovoid, often oblique, the laminae often cohering long after the tube has opened. Anthers all perfect, sessile in the base of the concave laminae, the connective not produced beyond the cells. Hypognous glands united in a single semiannular or semi-circular rarely disk-shaped gland occupying the upper side of the torus, in some species very small. Ovary stipitate but usually very shortly so, with 2 amphitropous ovules laterally attached about the middle; style either long and protruding from the slit of the perianth before the summit is set free from the limb as in *Grevillea*, or not exceeding the perianth, more or less dilated at the end into a straight or oblique or lateral cone or disk, bearing the small stigma in the centre of the disk or at the summit of the cone. Fruit a hard usually woody capsule opening in 2 valves. Seeds 2, compressed and collateral, the testa produced at the upper end into a broad membranous wing usually longer than the nucleus and more or less decurrent down the upper or both margins and sometimes completely surrounding the nucleus, the nucleus itself flat and smooth on the inner face (next the other seed), convex on the outer face and usually rugose or muricate, the protuberances fitting into corresponding cavities in the valve; each seed with its wing sometimes covering the whole inner surface of the valve,

more frequently placed near the upper margin and covering about half only or rather more, the remainder of the valve a hard woody mass.—Shrubs or rarely small trees. Leaves alternate, very diversified in shape, flat or terete, the margins rarely recurved, and the two surfaces usually similar and equally veined. Flowers in pairs along the rhachis of a short and dense raceme or cluster or rarely in a longer raceme; the clusters or racemes sessile in the axils or rarely also terminal or in a very few species all terminal. Indumentum as in *Grevillea*, consisting of closely appressed hairs attached by the centre, rarely of erect or spreading hairs.

The genus is limited to Australia.

The determination of the species of *Hakea* generally requires the presence both of flowers and fruit. Species, especially amongst the terete-leaved ones, with scarcely distinguishable flowers and leaves, have sometimes very different fruits, whilst closely similar fruits have occasionally very different flowers and leaves. I have found the flowers chiefly available for sectional, the fruits for specific distinction. The dorsal protuberances on the fruit-valves of some species usually called *spurs*, appear to me to be more appropriately termed *horns*, as they occur always close to the apex not to the base of the valve.—*Benth.*

SECT. 1. **Grevilleoides**.—*Flowers in oblong or cylindrical or rarely short racemes, without any involucre. Perianth much revolute. Stigmatic disk oblique or lateral, flat or broadly conical. Tropical or subtropical species.*

Leaves terete, usually very long.

Racemes as well as the whole plant quite glabrous . . . . . 1. *H. chordophylla*.

Racemes pubescent or villous.

Leaves mostly above 1ft. long. Racemes 3 to 6in. long. Perianth-tube 4 to 5 lines. Torus scarcely oblique . . . . . 2. *H. lorea*.

Leaves terete, pungent-pointed, smooth, usually under 6in. long, simple or once or twice forked. Flowers racemose or in racemose-panicles.

Perianth-tube hairy outside . . . . . 3. *H. Ivoryi*.

Leaves flat, linear, usually long.

Seed-wing not at all or scarcely decurrent along the nucleus.

Racemes 3 to 6in. long. Perianth villous, 5 to 6 lines long . . . . . 4. *H. macrocarpa*.

Racemes under  $\frac{1}{2}$ in. long, pedunculate. Perianth silky, under 2 lines . . . . . 5. *H. arborescens*.

Leaves thin-filiform, 7in. long. Peduncles about  $\frac{1}{2}$ in. long, bearing a dense corymb of small flowers . . . . . 6. *H. Persiehana*.

Leaves flat, 3-nerved, oblong or lanceolate. Racemes glabrous, about 2in. long. Perianth 3 lines . . . . . 7. *H. trineura*.

SECT. 2. **Euhakea**.—*Racemes usually short or reduced to sessile clusters, enclosed before their development in an involucre or bud of imbricate scales. Perianth revolute, at least under the limb. Stigmatic disk oblique or lateral, flat or slightly convex, without any cone.*

SERIES 1. **Pubifloræ**.—*Perianth pubescent. Torus straight or rarely oblique, the gland thick or semiannular. Leaves entire, toothed or divided.*

Leaves 3 to 5in. long. Perianth silky. Fruit 1in. long,  $\frac{1}{2}$ in. broad.

Fruit-beak straight or obsolete . . . . . 8. *H. eriantha*.

Fruit narrow, with an obliquely transverse crestlike rugose prominence below the beak . . . . . 9. *H. pugioniformis*.

Fruit ovoid, nearly smooth, with a broad smooth dark line down each suture . . . . . 10. *H. vittata*.

SERIES 2. **Glabrifloræ**.—*Perianth glabrous. Torus straight or slightly oblique, the gland semiannular or none.*

Leaves spatulate-oblong. Umbels axillary, peduncles slender. Flowers small. Style exceeding perianth. Fruit lanceolate-ovate, apex nearly straight . . . . . 11. *H. pedunculata*.

Leaves lanceolate, obtuse, entire . . . . . 12. *H. saligna*.

Leaves divided. Fruit scarcely horned. Seed-wing decurrent all round the nucleus . . . . . 13. *H. purpurea*.

Style not twice as long as the perianth.

Pedicels pubescent or hirsute, perianth alone glabrous. Branches densely villous. Fruit as broad as long, with a short incurved beak. 14. *H. gibbosa*.

Pedicels glabrous as well as the flower.

Flowers in short racemes, the peduncle and rhachis  $\frac{1}{2}$  to  $\frac{3}{4}$ in. long . . . . . 15. *H. leucoptera*.

Flowers in sessile clusters. Leaves some terete and some flat. Fruit  $\frac{1}{2}$ in. long,  $\frac{1}{4}$ in. broad. Seed-wing not decurrent . . . . . 16. *H. microcarpa*.

SECT. 3. **Conogynoides**.—Racemes usually short or reduced to sessile clusters, rarely elongated, enclosed before their development in an involucre or bud of imbricate scales. Perianth glabrous, revolute under the limb. Stigmatic cone erect or scarcely oblique.

SERIES 1. **Nervosæ**.—Leaves lanceolate or linear, prominently 3 or more-nerved (rarely 2 or 1-nerved when very narrow), smooth between the nerves.

Seed-wing decurrent on one side of the nucleus.

Leaves 4 to 6 in. long, falcate, 5 to 9-nerved. Perianth 2 lines long . . 17. *H. plurinervia*.

Leaves usually lanceolate, obtuse or acute, not pungent, usually 3-nerved. Perianth 1 line long. Pedicels silky-pubescent . . . 18. *H. dactyloides*.

1. **H. chordophylla** (leaves chord-like), *F. v. M. in Hook. Kew Journ.* ix. 23; *Benth. Fl. Austr.* v. 495. A tree perfectly glabrous and more or less glaucous. Leaves terete, smooth, mostly from  $\frac{1}{2}$  to 1 ft. long. Racemes from the old wood, loosely cylindrical, 3 to 4 in. long, quite glabrous. Pedicels about  $\frac{1}{4}$  in. long. Perianth glabrous, the tube 4 to 5 lines long, much dilated and oblique at the base, revolute under the limb. Torus very oblique. Gland large, horseshoe-shaped. Ovary stipitate; style long; stigmatic disk broad, oblique, not convex. Fruit obliquely lanceolate, about  $1\frac{1}{2}$  in. long and  $\frac{1}{2}$  in. broad near the base, tapering into a short slightly incurved beak. Seed-wing not decurrent along the nucleus.—Meissn. in DC. Prod. xiv. 699.

Hab.: Recorded for Queensland by *F. v. M.*

2. **H. lorea** (thong-like), *R. Br. Prot. Nov.* 25; *Benth. Fl. Austr.* v. 496. A tall shrub or tree attaining 20 ft. Leaves terete, smooth, often above 2 ft. long and rarely under 1 ft., very rarely (on barren branches? or young plants?) a few once or even twice forked or trifid. Racemes cylindrical, in the upper axils, sometimes forked or in a terminal cluster, rather dense, from under 3 in. to fully 6 in. long, the rhachis pedicels and perianths densely pubescent with short hairs, somewhat appressed. Perianth-tube nearly 4 lines long, slightly dilated below the middle, revolute upwards. Torus somewhat oblique. Gland large, horseshoe-shaped. Ovary stipitate; style long, with a very oblique, broadly conical stigmatic disk. Fruit  $1\frac{1}{4}$  in. long, ovate, somewhat flattened, and about  $\frac{3}{4}$  in. broad the flat way.—Meissn. in DC. Prod. xiv. 394; *F. v. M. Fragm. vi.* 189; *Grevillea lorea*, *R. Br. in Trans. Linn. Soc. x.* 177, Prod. 380.

Hab.: Shoalwater Bay, *R. Brown*; Port Denison, *Fitzalan*; Rockhampton, *Thozet*; Cape River and Nerook Creek, *Bowman*; Dyngie, *Miss Ross*; also in *Leichhardt's* collection.

The leaves are often infested with the blight fungus *Asterina Baileyi*.—*Berk. and Br.*

3. **H. Ivoryi** (after W. A. L. Ivory), *Bail.* A tree attaining the height of 30 to 40 ft., with a thick corky bark, branchlets often dark and more or less clothed with short appressed hairs. Leaves terete, pungent pointed, smooth, very slender, usually under 6 in. long, simple or once or twice forked, often crowded on the branchlets. Inflorescence silky-hairy, in simple racemes or paniculate with irregular raceme-like branches, some 3 in. long, dense, peduncle short, on which the hairs sometimes forms strigose tufts. Pedicels hairy, 3 lines long. Perianth-tube hairy outside, 3 lines long, greenish-white (perhaps when fresh yellowish-white), slightly enlarging towards the pedicel, revolute under the globular limb. Gland purple, prominent, narrow-horseshoe-shaped. Ovary stipitate, glabrous or slightly hoary. Style glabrous; stigmatic disk conical in the centre. Fruit nearly straight,  $1\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad, shortly tapering to the stipes and from above the middle upwards; dorsal protuberances small. Seed-wing not decurrent along the nucleus.

Hab.: Bingara, *J. F. Bailey*, 1896, flower specimens only; Charlotte Plains, *W. A. L. Ivory*, flower and fruit specimens, 1901.

4. **H. macrocarpa** (fruit long), *A. Cunn. in R. Br. Prot. Nov.* 30; *Benth. Fl. Austr.* v. 496. A tree of 15 to 20 ft. of robust growth with a rugged bark. Leaves linear-lanceolate, 6 to 8 in. long, 2 to 5 lines broad, mostly obtuse,



F. C. Wills.

F. Elliott, Lith.

*Hakea Ivoryi*, Baill.

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tapering at the base, thick, minutely silky pubescent on both sides, the veins longitudinal, slightly anastomosing, scarcely prominent. Racemes loosely cylindrical, 3 to 6 in. long, tomentose-pubescent as in *H. lorea*. Pedicels 2 to 5 lines long. Perianth-tube about 5 lines, oblique, dilated below the middle, revolute upwards. Torus oblique. Gland large, semicircular. Ovary shortly stipitate, style rather thick, not long; stigmatic disk oblique, broadly conical. Fruit ovate-lanceolate,  $1\frac{1}{2}$  to  $1\frac{3}{4}$  in. long, 7 to 8 lines broad.—Meissn. in DC. Prod. xiv. 411; F. v. M. Fragm. vi. 191; *Grevillea Alphonsiana*, F. v. M. in Hook. Kew Journ. ix. 22; Meissn. l.c. 699.

Hab.: Recorded by Queensland by F. v. M.

5. **H. arborescens** (tree-like), *R. Br. in Trans. Linn. Soc.* x. 187, *Prod.* 386; *Benth. Fl. Austr.* v. 497. A tall shrub or small tree, the young shoots silky. Leaves linear linear-lanceolate or sometimes rather broader and slightly falcate, obtuse or acuminate, contracted at the base, longitudinally but obscurely several veined, minutely silky-pubescent on both sides, 3 to 6 in. long. Flowers small, in short dense almost globular racemes or clusters on lateral peduncles of  $\frac{1}{4}$  to  $\frac{1}{2}$  in., often on the old wood. Pedicels filiform, 1 to 2 lines long. Perianth silky pubescent, the tube slender, scarcely  $1\frac{1}{2}$  line long, revolute under the limb. Torus straight. Gland semiannular, not very prominent. Ovary shortly stipitate. Stigmatic disk nearly straight with a short broad cone. Fruit nearly straight,  $1\frac{1}{2}$  to nearly 2 in. long, lin. broad, very shortly beaked. Seed-wing decurrent along the upper margin of the nucleus to the base.—Meissn. in DC. Prod. xiv. 410.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Rockingham Bay, *Dallachy*; Mount Elliott, *Fitzalan*.

6. **H. Persiehana** (after W. Persieh), *F. v. M., Austr. Journ. of Pharmacy*, Nov. 1886. A small tree with slender branchlets, clothed with an appressed down. Leaves thinly filiform, attaining 7 in. in length, glabrescent, not shining or furrowed, the apex pointed but the point easily wearing off. Peduncles about  $\frac{1}{2}$  in. long bearing dense corymbs of small flowers, the rhachis velvety; bracts minute, very deciduous; segments of perianths about 2 or 3 lines long, silky outside; pedicels about the length of perianth. Style almost glabrous; stigma hemispheric-conical, much broader than the summit of the style, peltate and quite terminal; hypogynous gland unilateral, adnate; ovary glabrous, nearly sessile; fruit lin. long,  $\frac{1}{2}$  in. broad, lanceolate-ellipsoid, almost dimidiate-oblique, smooth, shortly attenuated at the base, gradually narrowed into the acute apex. Seed-wing not decurrent along the nucleus.—From F. v. M.'s description in l.c.

Hab.: Endeavour River.

7. **H. trineura** (3-nerved), *F. v. M. Fragm.* iii. 146; *Benth. Fl. Austr.* v. 497. A tree?, the branches and foliage very minutely hoary-tomentose. Leaves oblong-cuneate or lanceolate, obtuse, contracted into a short petiole, 3 to 5 in. long, rather thick, triplinerved and very obliquely almost longitudinally veined, the margins nerve-like, not recurved, the veins equally conspicuous on both sides. Racemes axillary, about 2 in. long. Pedicels  $\frac{1}{2}$  to 1 in. long. Perianth glabrous as well as the whole inflorescence, the tube fully 3 lines long, revolute under the globular limb. Torus straight. Gland thick, semicircular. Ovary shortly stipitate; style long; stigmatic disk oblique, broad, conical in the centre. Fruit  $1\frac{1}{2}$  in. long,  $\frac{3}{4}$  in. thick, smooth, slightly incurved scarcely beaked. Seed-wings shortly decurrent on the upper margin of the nucleus.—*Grevillea trineura*, F. v. M. l.c.

Hab.: Broadsound, *Bowman*; Rockhampton, *Thozet*.

8. **H. eriantha** (flower woolly), *R. Br. Prot. Nov.* 29; *Benth. Fl. Austr.* v. 502. A tall shrub or small tree, the young shoots silky-pubescent, the adult foliage glabrous. Leaves lanceolate, acuminate, acute or with a callous point,

tapering into a short petiole, veinless except the scarcely prominent midrib, of a pale colour like those of *H. saligna* but rather thicker, 3 to 5 in. long. Flowers in axillary clusters, not very numerous. Pedicels silky-villous, 1 to 2 lines long. Perianth silky, the tube about 3 lines long, reflexed under the almost acute limb. Torus small. Gland prominent, semiannular. Ovary shortly stipitate; style not very long, with a large lateral stigmatic disk. Fruit about 1 in. long and under  $\frac{1}{2}$  in. broad, slightly incurved, rather smooth, with a short incurved or straight beak, very obscure when the fruit is quite ripe. Seed-wing very shortly decurrent on the upper side only of the nucleus.—Meissn. in DC. Prod. xiv. 417.

Hab.: Near Wallangarra.

9. *H. pugioniformis* (dagger-form), *Cav. Ann. Hist. Nat.* i. 213, t. 11, *lc.* vi. 24, t. 533; *Benth. Fl. Austr.* v. 506. A shrub usually of 2 to 4 ft., but sometimes twice as tall, the branches and foliage glabrous or very minutely silky-pubescent. Leaves terete, smooth, rigid with a short pungent point, from under 1 in. to near 2 in. long. Flowers few, in axillary sessile clusters. Pedicels 1 to 2 lines long, pubescent as well as the perianth with appressed or spreading hairs. Perianth-tube slender, 2 to 3 lines long, reflexed under the ovoid limb. Torus small. Gland prominent, semiannular or semicupular. Ovary shortly stipitate; style long, with a nearly straight convex or very broadly conical disk. Fruit, lanceolate, acuminate, about 1 in. long and  $\frac{1}{4}$  in. broad, rugose outside about the middle with an obliquely transverse prominent crest. Seed-wing scarcely decurrent on the upper side of the nucleus.—R. Br. in Trans. Linn. Soc. x. 178, Prod. 381; Meissn. in DC. Prod. xiv. 398; Hook. f. *Fl. Tasm.* i. 324; Lodd. Bot. Cab. t. 353; Reichb. *lc. et Descr. Pl.* t. 23.—*Conchium pugioniforme*, Sm. in Trans. Linn. Soc. ix. 122; *Conchium longifolium*, Sm. *lc.* 121; *Lambertia teretifolia*, Gærtn. f. *Fr.* iii. t. 217; *Banksia teretifolia*, Salisb. Prod. 51; *Hakea glabra*, Schrad. Sert. Hann. 27, t. 17; *H. glauca* and *H. parilis*, Knight, Prot. 106.

Hab.: In southern localities.

10. *H. vittata* (striped longitudinally), *R. Br. in Trans. Linn. Soc.* x. 182, Prod. 383; *Benth. Fl. Austr.* v. 507. Young shoots minutely ferruginous or hoary, the adult foliage glabrous. Leaves terete, slender, rigid, finely almost pungent-pointed, not attenuate at the base,  $1\frac{1}{2}$  to 3 in. long. Flowers not seen except some loose remains which appear to have been like those of *H. Pampliniana*, the perianth silky-pubescent, the torus small, the style rather long with an orbicular lateral stigmatic disk. Fruit ovoid, nearly  $\frac{3}{4}$  in. long, fully 4 lines broad, spotted or slightly verrucose, scarcely beaked, marked with a broad smooth dark line down each suture, the valves with a short dorsal horn near the end. Seed-wing decurrent along the upper margin only of the nucleus.—Meissn. in DC. Prod. xiv. 401.

Hab.: Curriwillinghamie, Barton.

11. *H. pedunculata* (pedunculate), *F. r. M., Melb. Chem. and Drugg., July* 1883. Leaves soon glabrous, spathulate-oblong, with a conspicuous petiole; veins faint. Umbels axillary on slender peduncles, slightly silky. Flowers small on pedicels the length of the flowers or longer. Style somewhat longer than the perianth; stigma lateral, hypogynous gland minute. Fruit lanceolate-ovate, nearly smooth, the pointed apex nearly straight. Seed-wing acute and but slightly decurrent along the nucleus.

Hab.: Endeavour River.

Wood dark-brown, close in the grain, nicely marked, and hard.—*Bailey's Cat. Ql. Woods*, No. 341a.

12. *H. saligna* (willow-like), *Knight, Prot.* 108; *Benth. Fl. Austr.* v. 512. A tall bushy shrub, quite glabrous or the young shoots slightly silky. Leaves usually lanceolate, obtuse or with a short callous point, tapering into a short



petiole, 3 to 6 in. long, but sometimes oblong-elliptical and 2 to 4 in. long, of a pale colour, veinless or obscurely and obliquely penniveined. Flowers small, in dense axillary clusters, the very short rhachis hirsute. Pedicels glabrous, filiform, about 3 lines long. Perianth glabrous, the tube scarcely 2 lines long, much revolute under the globular limb. Torus small. Gland small. Ovary nearly sessile; style long, with a large lateral convex stigmatic disk. Fruit about 1 in. long,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. broad, with a short incurved beak, more or less rugose and sometimes covered with large very prominent tubercles. Seed-wing shortly decurrent along the upper margin of the nucleus.—R. Br. in Trans. Linn. Soc. x. 185; Prod. 385; Meissn. in DC. Prod. xiv. 416; Sweet, Fl. Austral. t. 27; *Embothrium salignum*, Andr. Bot. Rep. t. 215; *Conchium salignum*, Sm. in Trans. Linn. Soc. ix. 124; *Embothrium salicifolium*, Vent. Jard. Cels. t. 8; *Conchium salicifolium*, Gærtn. f. Fr. iii. 217; *Hakea mimosoides*, A. Cunn.; Meissn. in DC. Prod. xiv. 416; *H. florulenta*, Meissn. in Hook. Kew. Journ. vii. 116, and in DC. Prod. xiv. 416.

Hab.: Araucaria Ranges, *Leichhardt*; Brisbane River, Moreton Bay, *A. Cunningham*, *J. v. Mueller*; Wallangarra and Stanthorpe.

13. **H. purpurea** (purple), *Hook. in Mitch. Trop. Austr.* 348; *Benth. Fl. Austr.* v. 513. A hard rigid bushy shrub of several ft., glabrous except a few silky hairs on the very young shoots. Leaves terete, smooth, once or twice bifid or trifid, rigid and pungent-pointed, the whole leaf usually  $1\frac{1}{2}$  to 2 in. long, the divided portion about as long as the simple base. Flowers crimson, in sessile or shortly pedunculate axillary umbels. Pedicels glabrous, filiform, 3 or 4 lines long. Perianth glabrous, the tube about 5 lines long, dilated below the middle, open early along the under side, attenuate and revolute under the limb. Torus straight, rather broad. Gland scarcely prominent. Ovary shortly stipitate; style long, with an oblique almost lateral stigmatic disk. Fruit  $1\frac{1}{4}$  to  $1\frac{1}{2}$  in. long,  $\frac{3}{4}$  in. broad, nearly straight, scarcely beaked. Seed-wing very broad, decurrent down both margins and round the base of the nucleus.—Meissn. in Linnæa xxvi. 358, and in DC. Prod. xiv. 404; *Grevillea trisecta*, F. v. M. First Gen. Rep. 17 (name only).

Hab.: Warrego River, *Mitchell*; and other inland localities.

14. **H. gibbosa** (swollen), *Car. Anal. Hist. Nat.* i. 215; *Id.* vi. 24, t. 534; *Benth. Fl. Austr.* v. 513. A shrub of several ft., the branches and young leaves hirsute with spreading hairs, the older foliage sometimes glabrous. Leaves terete, entire, smooth, rigid, pungent-pointed, 1 to 3 in. long. Flowers in sessile axillary clusters. Pedicels short, densely villous. Perianth glabrous, the tube about 3 lines long, revolute under the globular limb. Ovary contracted into a very short stipes; style not long, with an oblique stigmatic disk. Fruit ovoid-globular, oblique, about 1 in. diameter, rugose, with a very short thick obtuse oblique or incurved beak, the valves with small dorsal horns near the end. Seed-wing narrowly decurrent down both margins of the nucleus.—R. Br. in Trans. Linn. Soc. x. 181, Prod. 382; Meissn. in DC. Prod. xiv. 401; *Banksia gibbosa*, Sm. in White Voy. 224, t. 22, f. 2; *Conchium gibbosum*, Sm. in Trans. Linn. Soc. ix. 119; *Conchium sphaeroideum*, Sm. l.c. 120; *Conchium cornutum*, Gærtn. f. Fr. iii. 216, t. 219; *Hakea pubescens*, Schrad. Sert. Hannov. 27; *Conchium pubescens*, Willd. Enum. Hort. Berol. 141; *H. pinifolia*, Salisb. Prod. 51; *H. lanigera*, Ten. Fl. Nap. i. 22, t. 6.

Hab.: Moreton Island, *J. F. Shirley*; Fraser Island, *Hon. Miss Lovell*.

15. **H. leucoptera** (light-coloured wing), *R. Br. in Trans. Linn. Soc.* x. 180, Prod. 382; *Benth. Fl. Austr.* v. 515. A shrub with rather slender virgate branches, minutely hoary-pubescent. Leaves terete, smooth, mucronate with fine straight rigid points, more or less attenuate at the base,  $1\frac{1}{2}$  to 3 in. long.

Flowers small, in short racemes or clusters pedunculate in the axils or rarely terminating short leafy branches, the peduncle and rhachis minutely silky-pubescent,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Pedicels glabrous, 2 to  $2\frac{1}{2}$  lines long. Perianth glabrous, the tube about  $2\frac{1}{2}$  lines long, slightly dilated below the middle, revolute under the limb. Torus slightly oblique. Gland semiannular. Ovary stipitate; style not long, with a very oblique almost lateral stigmatic disk. Fruit about 1 in. long,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. broad, often somewhat verrucose, with a short conical beak, the valves without any or with scarcely prominent dorsal protuberances at the end. Seed-wing usually more or less decurrent along the upper margin only of the nucleus.—Meissn. in DC. Prod. xiv. 396; F. v. M. Fragm. vi. 219 (but not all the synonyms adduced); *H. leucocephala*, Dietr. Syn. Pl. i. 531 (by a misprint); *H. virgata*, R. Br. Prot. Nov. 26; Meissn. in D.C. Prod. xiv. 395; *H. tephrosperma*, R. Br. l.c.; Meissn. l.c. 402; *H. longicuspis*, Hook. in Mitch. Trop. Austr. 397; Meissn. l.c. 395; *H. stricta*, F. v. M.; Meissn. in Linnaea xxvi. 360 and l.c. 400.

Hab.: Armadilla, Barton. A common inland species.

16. **H. microcarpa** (fruit small), R. Br. in Trans. Linn. Soc. x. 182, Prod. 383; Benth. Fl. Austr. v. 516. A shrub varying from 2 or 3 ft. to twice that height, quite glabrous or with a very minute pubescence on the young branches and foliage. Leaves mostly terete and smooth, slender or thick, from 1 in. in some specimens to 4 in. long in others, but sometimes the lower ones or in other specimens nearly or quite all more or less compressed or channelled above, or quite flat and linear-lanceolate with the midrib and margins prominent underneath. Flowers in axillary clusters. Perianth glabrous as well as the pedicels, the tube usually about 2 lines long but variable in size, revolute under the limb. Torus straight. Gland semiannular. Ovary shortly stipitate; style not long, with a broad, somewhat oblique stigmatic disk. Fruit  $\frac{1}{2}$  to nearly  $\frac{3}{4}$  in. long, about  $\frac{1}{4}$  in. broad, oblique, smooth or slightly rugose, the valves with short dorsal horns near the end sometimes reduced to small protuberances or almost obsolete.—Meissn. in DC. Prod. xiv. 400; Hook. f. Fl. Tasm. i. 324; Bot. Reg. t. 475; Lodd. Bot. Cab. t. 219; *H. patula*, R. Br. Prot. Nov. 27; Meissn. l.c. 401; *H. bijrns*, Meissn. l.c. 400.

Hab.: Towards Wallangarra.

17. **H. plurinervia** (nerves numerous), F. v. M. Herb.; Benth. Fl. Austr. v. 523. A shrub of 6 or 7 ft., the young branches loosely tomentose. Leaves lanceolate, falcate, obtuse and often oblique at the end, with a small callous point, tapering into a very short petiole or almost sessile, 4 to 6 in. long and  $\frac{1}{2}$  to  $\frac{3}{4}$  in. broad, with about 7 longitudinal nerves prominent on both sides. Flowers small and numerous in axillary clusters, the villous rhachis rarely above 1 line long. Pedicels glabrous, 2 or 3 lines long. Perianth glabrous, the tube scarcely above 2 lines long, slender, revolute under the ovoid-globular limb. Torus small, oblique. Gland scarcely prominent. Ovary shortly stipitate; style not long, with an erect stigmatic cone. Fruit above 1 in. long and nearly  $\frac{3}{4}$  in. broad, more or less falcate, with an incurved conical beak. Seed-wing narrowly but unequally decurrent along both sides of the nucleus.

Hab.: Rockingham Bay, Dallachy; and other northern localities.

18. **H. dactyloides** (finger-like), Car. Anal. Hist. Nat. i. 215 t. 12; Ic. vi. 25, t. 535; Benth. Fl. Austr. v. 524. A tall shrub with erect branches, the young shoots usually silky, the adult foliage rarely retaining more or less of pubescence, usually quite glabrous. Leaves from linear-lanceolate to oblong-lanceolate, acute or scarcely obtuse, tapering into a short petiole, falcate oblique or straight, 2 to 4 in. long, rigid, prominently triplinerved, smooth between the nerves or rarely in the broader leaves a few irregular veins forming almost

1 or 2 additional longitudinal nerves. Flowers very small and numerous in axillary clusters or short racemes, the villous rhachis 1 to  $1\frac{1}{2}$  line long. Pedicels silky-hairy, 1 to  $1\frac{1}{2}$  line long. Perianth glabrous, the tube about 1 line long, revolute under the globular limb. Torus small, nearly straight. Gland small. Ovary shortly stipitate; style short, with an erect stigmatic cone. Fruit  $\frac{3}{4}$  to 1 in. long,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. thick, smooth or slightly rugose, with a very small straight beak. Seed-wing narrowly decurrent along the upper margin only of the nucleus.—R. Br. in Trans. Linn. Soc. x. 186, Prod. 385; Meissn. in DC. Prod. xiv. 415; Bot. Mag. t. 3760; *Banksia dactyloides*, Gærtn. Fr. i. 221, t. 47; *Conchium dactyloides*, Vent. Jard. Malm. t. 110; Sm. in Trans. Linn. Soc. ix. 123; *Banksia oleifolia*, Salisb. Prod. 51; *Conchium nervosum*, Sm. in Willd. Enum. Hort. Berol. 141; *Hakea nervosa*, Knight, Prot. 108; *H. ferruginea*, Lodd. Bot. Cab. t. 1501? not of Sw.

Hab: Towards Wallangarra.

#### 14. CARNARVONIA, F. v. M.

(After the Earl of Carnarvon.)

Flowers hermaphrodite. Perianth regular, nearly cylindrical in the bud, the segments free or nearly so, recurved in the upper portion, without distinct laminae. Anthers all perfect, linear, sessile below the middle of the perianth, the connective produced beyond the cells. No hypogynous glands. Ovary sessile or nearly so, tapering into an erect style with a small terminal stigma; ovules 2, laterally attached below the middle to a short funicle. Fruit a hard incurved follicle. Seeds compressed, produced at the upper end into a long wing.—A tree with compound leaves. Flowers small, in axillary simple or compound irregular racemes.

The genus is limited to a single species, endemic in Australia, with the flowers nearly of *Persoonia*, but with the fruit of *Hakea*. It is also closely allied in character to *Orites*, but with a very different habit and inflorescence.—Benth.

1. **C. araliæfolia** (Aralia-leaved), F. v. M. *Fragm.* vi. 81, t. 55, 56; *Benth. Fl. Austr.* v. 410. Red Oak, "Niah," Evelyn Scrub, J. F. Bailey. A small or moderately-sized tree, the young leaves slightly pubescent underneath, the inflorescence usually pubescent, the older leaves glabrous. Leaves compound, with 3 to 5 petiolulate leaflets digitate at the extremity of the petiole, or 1 to 3 of the leaflets replaced by pinnae, each with 2 or 3 petiolulate leaflets not digitate, the leaflets from broadly obovate and very obtuse to illiptical oblong or lanceolate and acute, entire or remotely toothed, tapering at the base, 3 to 5 in. long, the whole leaf from 6 or 8 in. to twice that length. Racemes very irregular, simple or more frequently compound, much shorter than the leaves with small deciduous trifoliate bracts under the branches, and a narrow entire one under each flower, or under a cluster of 3 to 6 flowers terminating the peduncle or branches. Pedicels softly hirsute, 2 to 3 lines long, glabrous and twice as long when in fruit. Perianth about 2 lines long, densely hirsute with soft hairs. Ovary glabrous. Follicle much incurved, acuminate,  $1\frac{1}{2}$  in. long. Wing of the seed twice as long as the seed itself, the raphe much within the margin.

Hab.: Rockingham Bay, *Dallachy*; Herberton District, J. F. Bailey.

Wood of a red colour, firm, fine-grained, useful for cabinetmakers and coopers' work.—Bailey's *Cat. Ql. Woods*, No. 342.

#### 15. BUCKINGHAMIA, F. v. M.

(After the Duke of Buckingham.)

Flowers hermaphrodite. Perianth irregular, the tube slender, revolute under the globular limb. Anthers all perfect, sessile in the base of the concave aninæ, the connective not produced beyond the cells. Hypogynous glands

united in a single semiannular truncate and crenulate gland. Ovary shortly stipitate, with 4 collateral amphitropous ovules attached about the middle; style filiform, with an oblique almost lateral disk at the end, with the small stigma in its centre. Fruit a compressed follicle, opening along the upper suture. Seeds 4, sometimes 1 or 2, abortive, very flat and thin, surrounded by a narrow wing-like margin.—Tree. Leaves on the old trees undivided, deeply 3 or more lobed on young plants, penniveined. Flowers small, pedicellate in pairs in terminal racemes. Bracts none or very deciduous.

The genus is limited to a single species endemic in tropical Australia and closely allied to the *Grevilleæ* of the section *Cycloptera*, differing only in the number of ovules and seeds.—*Benth.*

1. ***B. celsissima*** (very lofty), *F. v. M. Fragm.* vi. 248; *Benth. Fl. Austr.* v. 532. A tree attaining 60ft. or more, the young branches and inflorescence minutely hoary-tomentose. Leaves petiolate, elliptical-oblong, acute or obtuse, tapering at the base, 3, 5 or more in. long, dark green and apparently glabrous above but sprinkled with minute hairs only visible under the lens, glaucous or almost silvery underneath, covered with the same grevillioïd hairs. Racemes 4 to 8 in. long, somewhat secund, the flowers crowded nearly from the base. Pedicels slender, about  $\frac{1}{4}$  in. long. Perianth silvery, 3 to 4 lines long. Anthers broad, with a thick rather broad connective. Ovary glabrous. Follicle broadly and obliquely ovate, about 1 in. long, with a short incurved point. Seeds broadly obovate.

Hab.: Rockingham Bay, *Dallachy*; and other northern localities.

## 16. DARLINGIA, F. v. M.

(After Sir Ralph Darling).

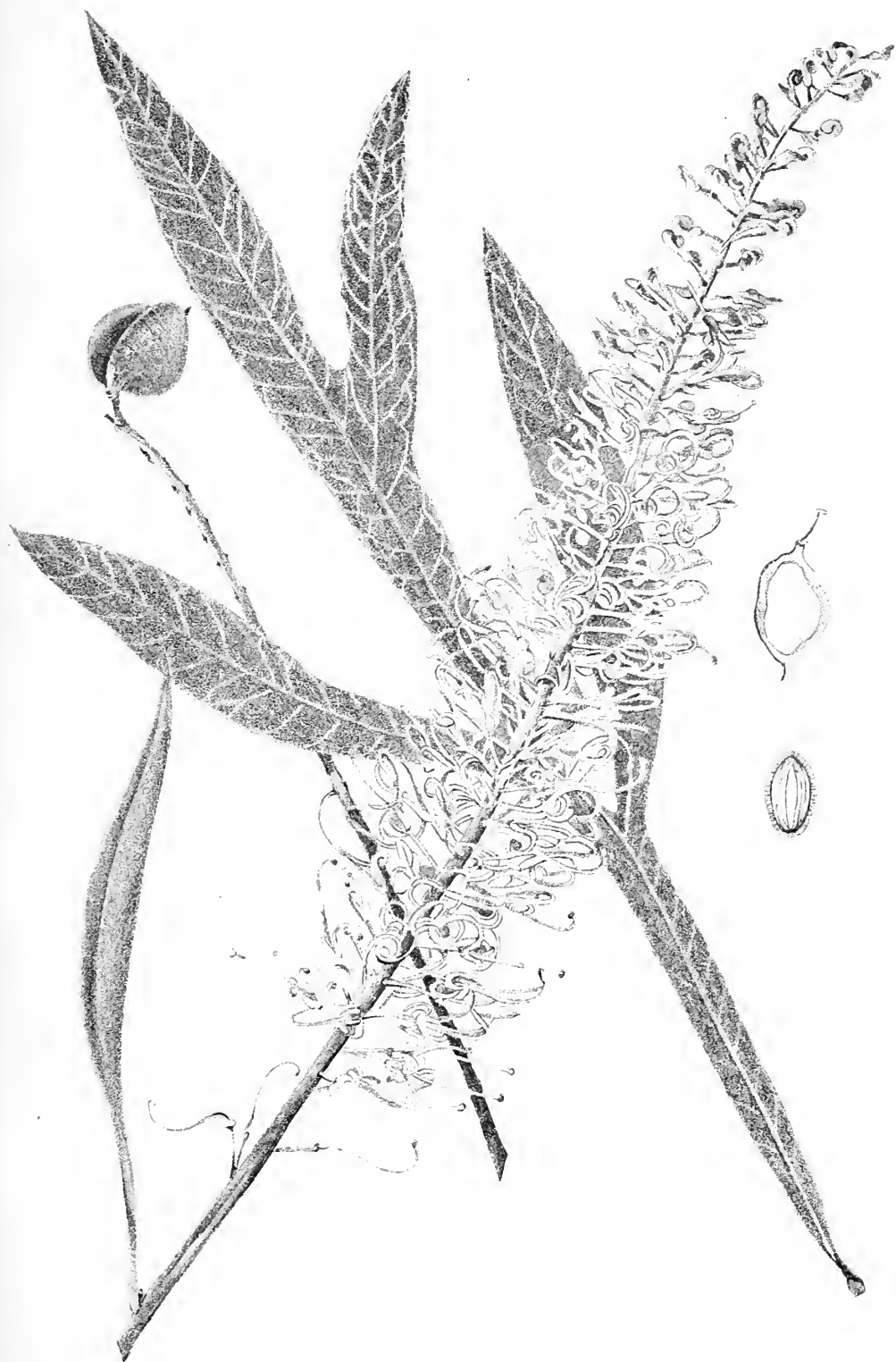
Flowers hermaphrodite. Perianth regular, the tube slender, straight, the limb globular, erect. Anthers all perfect, sessile in the base of the concave lamina, the connective produced beyond the cell into a minute gland-like appendage. Hypogynous glands 4, globular. Ovary sessile, with 4 collateral amphitropous ovules attached about the middle; style filiform, with an ovoid fusiform end and a small terminal stigma. Fruit a compressed follicle, opening along the upper suture. Seeds very flat and thin, surrounded by a wing-like margin.—Tree. Leaves entire or pinnatifid, penniveined. Flowers sessile in pairs in terminal paniculate racemes. Bracts none or minute and deciduous.

The genus is limited to a single species endemic in tropical Australia. Like *Buckinghamia* it is closely allied to *Grevillea*, differing only in the number of ovules and seeds, and distinguished from *Buckinghamia*, like the sections *Anadenia* and *Manglesia* from *Eugrevillea*, chiefly in the straight perianth. The sessile flowers and minute appendages to the anther remove it also in a slight degree from both genera.—*Benth.*

1. ***D. spectatissima*** (very notable), *F. v. M. Fragm.* v. 152; *Benth. Fl. Austr.* v. 533. "Chalagar," Barron River, *J. F. Bailey*. A tree, quite glabrous or the inflorescence minutely ferruginous-pubescent. Leaves oblong or oblanceolate, obtuse or acute, entire or deeply 3-lobed or pinnatifid with 5 to 7 long lanceolate acute lobes, tapering into a rather long petiole, the whole leaf 8 or 9 in. to 1½ ft. long, penniveined with rather numerous almost parallel primary veins. Racemes in the upper axils 4 to 8 in. long, forming a terminal panicle shorter than the leaves, with numerous flowers. Perianth glabrous,  $\frac{3}{4}$  in. long, the tube slender, the lamina tipped with small dorsal obtuse appendages, distinct in the bud. Ovary villous; style long. Follicle 1½ to nearly 2 in. long, nearly 1 in. broad, recurved. Seeds oblong, as long as the follicle.—*Helicia Darlingiana* *F. v. M. Fragm.* v. 21; *Knightsia Darlingii*, *F. v. M. l.c.* 152.

Hab.: Rockingham Bay, *Dallachy*; Barron River, *J. F. Bailey*.

Wood tough, nicely marked, and should prove useful timber for cooper and cabinet work.—*J. F. Bailey*, Report on Timber of Herberton District, Sept., 1899.



F.C. 11. 12

F. Elliott, Lith.

*Buckinghamia celsissima*, F. & M.

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## 17. MUSGRAVEA, F. v. M.

(After Sir Anthony Musgrave, G.C.M.G., a Governor of Queensland).

Flowers small, in spike-like racemes, nearly straight before expansion. Perianth-segments separately seceding. Stamens inserted near the summit of the segments. Free portion of filaments very short. Anthers apiculate. Hypogynous glands usually 3, somewhat distant from each other, upwards gradually pointed. Style capillary. Stigma terminal, conical-ovate. Ovary sessile; ovules 2, laterally attached, their base free. Fruit comparatively large, dimidiate-orbicularly ellipsoid; exocarp hard, anteriorly deliscent.

1. *M. stenostachya* (spikes slender), *F. v. M., Linn. Soc. of N.S.W., March 26, 1890.* A tree known to attain 50ft. in height, and perhaps getting even higher. Leaves of very firm consistence, scattered or crowded, on stalks of moderate length or short, from 2 to 4in. long, obovate-elliptical when entire, the lobed ones 1 to 1½ft. long, above glabrous, beneath greyish or brownish from a very thin vestiture; primary-lateral venules pennular-spreading; ultimate venules closely reticular-joined, rather prominent beneath. Racemes numerous in the upper axils very slender, many-flowered, from 2 to 8in. long, or forming terminal panicles. Flowers about ¼in. long, in pairs on very short stalks, but unprovided with stalklets; each pair from the summit of the stalk supported by 3 long persistent very short bracts. Perianth-segments outside beset with appressed greyish hairs. Style about ½in. long, glabrous towards the summit. Stigma minute. Ovary bearing a brownish close vestiture. Fruit 1½ to 2in. long, much attenuated into the base; exocarp thick, almost lignescent and at last flatly expanding. Seeds oblong.

Hab.: On Mount Bellenden Ker, *W. Sayer* (F. v. M.); on the Johnstone River, *Dr. Th. L. Bancroft*.

Wood of a light-brown colour, nicely marked, light and firm; a useful wood for both cooper and cabinetmaker. Does not shrink or warp much in drying.—*Bailey's Cat. Ql. Woods, No. 344.*

## 18. HOLLANDÆA, F. v. M.

(Name after Sir Henry Holland, Bart., one time Secretary of State for the Colonies).

Flowers hermaphrodite. Perianth-segments regular at first, coherent into a straight tube, soon disconnected. Stamens inserted on the laminae. Anthers almost sessile, broadly linear bluntly apiculated by prolongation of the connective; pollen-grains roundish, tetrahedral, smooth. Style straight, capillary. Stigma ellipsoid clavate, terminal. Hypogynous glands 4, roundish, somewhat connate. Ovary sessile, conical-ellipsoid; ovules many, 2-seriate, placed horizontally. Fruit large, bursting anteriorly into 2 hard, widely expanded, dorsally connate valves. Seeds several, placed in 2 rows against each other horizontally, comparatively very large, flatly compressed, except the terminal and basal seed; all others either dimidiate or truncate; orbicular, very thick, the inner margin often triangular and overlapping. Testa membranous and partly chartaceous, not expanding into any appendage. Albumen none. Cotyledons whitish, hard-fleshy, thick, more or less unequal, flat on one side, angular on the other, dorsally broad and abruptly rounded, anteriorly narrow-edged. Radicle minute, enclosed within the cotyledons, near the point of the attachment of the seed. An endemic tropical tree, with rather large leaves, scattered or sometimes opposite; racemes pendulous, much elongated, lateral, and perhaps also terminal. Bracts minute. Flowers in pairs on semi-connate pedicels; perianth-segments quite straight before expansion. Fruit ovate-ellipsoid; exocarp dry, transversely impressed inside.

Racemes pendulous, lateral or axillary . . . . . 1. *H. Sayeri*.

Racemes erect near the ends of the branchlets . . . . . 2. *H. Lamingtoniana*.

1. **H. Sayeri** (after W. Sayer), *F. v. M. in Melb. Chem. and Drugg. New Ser.* ii. 173. Tree about 40ft. high, bark smooth ashy-grey. Leaves scattered, shortly stalked, roundish, ovate, remotely toothed, 9in. long, 6in. broad, dark-green, somewhat acute at the base, firmly chartaceous, the lateral nerves rather distant, anastomosing towards the margin, the meshes of primary veins ample. Racemes pendulous, sometimes a foot long, lateral, short-stalked, rhachis glabrous. Bracts minute, narrow, acute. Pedicels very short, semi-connate in pairs, slightly silky. Perianth-segments about  $\frac{3}{4}$ in. long, very narrow, except the laminae which is rather broad. Anthers oblong-linear, conspicuously apiculated by the broad connective. Style hardly longer than the perianth-segments, capillary. Stigma short, clavate-ellipsoid. Ovary glabrous; hypogynous glands roundish, somewhat connate. Fruit  $2\frac{1}{2}$  to 6in. long, the transverse ridges inside the valves only slightly prominent, through marking of the respective spaces occupied by each of the seeds. Seeds fully 1in. long and  $\frac{3}{4}$ in. broad, and about  $\frac{1}{2}$ in. thick; testa brown, smooth. The fruit somewhat resembles that of *Cardwellia sublimis*.—*Helicia Sayeri*, *F. v. M. in Viet. Nat.*, Nov, 1886.

Hab.: Russell River and base of Mount Bellenden Ker, *W. Sayer* (*F. v. M.*); Harvey's Creek, *Bail.*, Bellenden Ker Exped. 1889; Russell River.

2. **H. Lamingtoniana** (after His Excellency Lord Lamington), *Bail.* A handsome tree of medium size; the branchlets, petioles, leaf-nerves, and inflorescence more or less densely clothed with short bright ferruginous hairs. Leaves roundish-ovate, cuneate at the base, 4 to 6in. long,  $2\frac{1}{2}$  to  $3\frac{1}{2}$ in. broad, the margins with distant small glandular teeth, the upper surface dark glossy-green, veins and veinlets hairy on the underside; primary nerves rather distant, prominent. Racemes axillary towards the ends of the branchlets, erect, rather stout,  $2\frac{1}{2}$  to 4in. long on short petioles; bracts minute, flowers dense, the pedicels more or less connate, about 2 lines long. Perianth 8 to 9 lines long, straight, the segments much curled back after expansion. Anthers linear, apiculate, light-coloured like the inside of the segments. Style capillary, nearly as long as the segments; stigma linear. Ovary silky; hypogynous scales free, oblong, membranous, light-coloured, and hairy. No fruit to hand.

Hab : Evelyn. *J. F. Bailey*.

Wood tough, with the pretty marking of the Order.

## 19. CARDWELLIA, *F. v. M.*

(After Edward Cardwell.)

Flowers hermaphrodite. Perianth somewhat irregular, the tube open along the lower side, tapering at the top and recurved under the obliquely globular limb. Anthers ovate, sessile in the concave laminae. Hypogynous glands 4. Ovary contracted into a short stipes; style elongated, dilated at the top into a lateral disk stigmatic in the centre; ovules several, laterally attached near the top and imbricate downwards in 2 rows. Fruit thick and woody, opening at length into a broad follicle. Leaves alternate, abruptly pinnate. Seeds very flat, oblong, surrounded by a wing-like margin.—Tree. Flowers in terminal racemes, in pairs, with the very short pedicels united. Bracts not seen.

The genus is limited to a single species endemic in Australia.

1. **C. sublimis** (lofty), *F. v. M. Fragm.* v. 24, 38, 73 and 152; *Benth. Fl. Austr.* v. 538. "Gold Spangled wood," in the North; "Silky Oak," "Oongaary," Tully River, *J. F. Bailey*. A large tree, the young branches and inflorescence minutely hoary-tomentose, the adult foliage glabrous. Leaves above 1ft. long; leaflets 4 to 10, opposite or alternate, all on rather long petiolules, ovate or oblong, obtuse, coriaceous, veined, green above, pale glaucous or fulvous underneath, 3 to 5in. long. Racemes several in a terminal panicle,



sometimes shorter sometimes longer than the leaves. Pedicels exceedingly short. Perianth hoary-tomentose, the tube about  $\frac{1}{2}$  in. long. Hypogynous glands globular. Ovules 12 to 16. Fruit oblong, 3 in. long,  $1\frac{3}{4}$  in. broad. Seed about 3 in. long,  $\frac{3}{4}$  in. broad.

Hab.: Mountains about Rockingham Bay, *Dallachy*; Barron River, *J. F. Bailey*.

Wood of a light colour, prettily marked; suitable for cabinet-work, wine-casks, and coopers' work; stands well in drying.—*Bailey's Cat. Ql. Woods*, No. 345.

## 20. STENOCARPUS, R. Br.

(Narrow fruit.)

(*Agnostus*, *A. Cunn.*)

Flowers hermaphrodite. Perianth slightly irregular, the tube opening along the lower side, the limb nearly globular and recurved, the segments at length separating. Anthers broad, sessile within the concave laminæ, the connective not produced beyond the cells. Hypogynous glands united in a short semiannular disk or cup or almost obsolete. Ovary stipitate, tapering into a long style dilated at the top into a flat oblique disk, stigmatic in the centre; ovules several, laterally attached at or near the top, imbricate downwards in 2 rows. Fruit a foliicle, usually narrow, coriaceous; seeds produced at the lower end into a membranous wing.—Trees. Leaves alternate or scattered, entire or deeply pinnatifid with few lobes. Peduncles terminal or in the upper axils, sometimes several in an umbel or short raceme, each bearing an umbel of pedicellate red or yellow flowers. Bracts none or falling off at a very early age.

The genus extends to New Caledonia, the Australian species are however all endemic.

Leaves 6 in. to 1 ft. long. Perianths above 1 in. long, the pedicels radiating in a single row round the disk-like end of the peduncle. . . . . 1. *S. sinuatus*.  
Leaves under 6 in. Perianth  $\frac{1}{2}$  in. long or less, the pedicels irregularly crowded on the summit of the peduncle. Ovary usually pubescent . . . . . 2. *H. salignus*.

1. ***S. sinuatus*** (sinuate), *Endl. Gen. Pl. Suppl.* iv. 88; *Benth. Fl. Austr.* v. 539. "Tulip-flower," "White Silky Oak," of Barron River. A tree sometimes described as small and slender, sometimes said to attain 60 to 100 ft., glabrous or the inflorescence minutely tomentose. Leaves petiolate, either undivided oblong-lanceolate and 6 to 8 in. long, or pinnatifid and above 1 ft. long, with 1 to 4 oblong lobes on each side, mostly obtuse, quite glabrous but reddish underneath, penniveined and minutely reticulate. Peduncles terminal, either 2 or more together in a general umbel, or several at some distance forming a short broad raceme, each peduncle 2 to 4 in. long, and bearing an umbel of 12 to 20 bright red flowers, the pedicels about  $\frac{1}{2}$  in. long, radiating in a single row round the disk-like dilated summit of the peduncle. Perianth tube 1 in. long or rather more, straight, tapering upwards, the limb recurved, globular, about 2 lines diameter. Ovary densely pubescent, on a glabrous stipes, with a rather thick glabrous style. Ovules 12 to 14. Fruit about 4 in. long, narrowing towards each end, containing numerous closely packed winged seeds.—*Meissn. in DC. Prod.* xiv. 451; *Agnostus sinuatus*, *A. Cunn. in Loud. Hort. Brit.* 580; *Stenocarpus Cunninghamii*, *Hook. Bot. Mag. t.* 4263 (copied into *Fl. des. Serres.* iii. 189, t. 7) not of R. Br.; *Paxt. Mag.* xiv. i. with a fig.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *W. Hill*; Araucaria Ranges, *Leichhardt*; Queensland woods, London Exhibition, 1862, *W. Hill*, n. 17; Barron River, *J. F. Bailey*.

Wood of a light colour, close in grain, tough and firm; suitable for cabinet-work or any work in which English Beech is employed.—*Bailey's Cat. Ql. Woods*, No. 346.

2. ***S. salignus*** (willow-like), *R. Br. in Trans. Linn. Soc.* x. 202, *Prod.* 391; *Benth. Fl. Austr.* v. 539. "Silky Oak," of some. A moderate-sized tree, glabrous or the inflorescence minutely pubescent. Leaves in the typical form ovate-lanceolate or elliptical, acute acuminate or rarely obtuse, tapering into a short petiole,

2 to 4 in. long, varying from penniveined to triplinerved (the lower primary veins scarcely longer or much longer and thicker than the others), but the veins usually indistinct slightly prominent or almost immersed, a few leaves on young trees or barren branches larger and pinnatifid. Peduncles slender, terminal or in the upper axils, usually shorter than the leaves, bearing a single umbel of 10 to 20 flowers or in luxuriant specimens as many as 30 flowers. Pedicels  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, irregularly crowded on the summit of the peduncles. Perianth usually under  $\frac{1}{2}$  in. long. Ovary slightly silky-pubescent or nearly glabrous. Ovules 6 to 8, not so closely imbricate nor so narrow and compressed as in *S. sinuatus*. Fruit narrow, several inches long, closely packed with winged seeds.—Meissn. in DC. Prod. 451: Bot. Reg. t. 441; *Hakea rubricaulis*, Colla, Hort. Ripul. App. i. 114. t. 3; *Embothrium rubricaulis*, Giord. Obs. 1837 (Meissn.); *Stenocarpus acacioides*, F. v. M. Fragm. i. 135.

Hab.: Ranges in southern localities.

Var. *Moorei*. Leaves broader and usually more distinctly tripli or quintuplinerved, the ovary minutely pubescent.—*S. Moorei*, F. v. Muell. Fragm. i. 134, v. 154.—Rockingham Bay, *Dallachy*; Mount Lindsay, *W. Hill*.

Wood of a red colour, hard, close-grained, and nicely marked; useful for the finer kinds of coopers' work and cabinet.—*Bailey's Cat. Ql. Woods*, No. 347.

Var. *concolor*. Leaves more prominently tripli or rarely quintuplinerved, the reticulations also more distinct. Flowers rather larger. Ovary glabrous or nearly so.—*S. concolor*, F. v. Muell. Fragm. iii. 147, v. 154.—Broadsound and near Maryborough, *E. Bowman*.

## 21. LOMATIA, R. Br.

(From *loma*, a border, Seeds winged.)

(*Tricondylus*, *Salisb.*)

Flowers hermaphrodite. Perianth irregular, the tube oblique, open along the lower side, tapering at the top, the limb ovoid-globular, recurved, the laminae long cohering. Anthers ovate, sessile in the concave laminae. Hypogynous glands 3, broad and truncate, the fourth upper one deficient. Ovary on a long stipes, tapering into a long style dilated at the top into a flat oblique disk stigmatic in the centre; ovules several, laterally attached below the middle, amphitropous, imbricate upwards in 2 rows. Follicle coriaceous, opening almost flat. Seeds imbricate upwards, with a broad terminal nearly straight wing, surrounded by the marginal raphe.—Shrubs or trees. Leaves alternate, entire, toothed or pinnately divided, very variable on the same individual. Flowers pedicellate in pairs, in terminal or axillary simple or slightly branched racemes. Bracts under each pair usually small narrow and very deciduous or often entirely wanting. Perianths white or pale yellow, sometimes assuming at length a reddish tint.

The genus is also represented in the mountains of extratropical South America, but the Australian species appear to be all endemic. The structure and proportions of the parts of the flower and fruit are remarkably uniform in the Australian species, leaving little for their distinction besides the foliage which is eminently variable. The thin fragile pellicle or powdery substance interposed between the seeds in this genus and in *Telopea*, appears to be an epidermal production of the seed itself, but its real nature can scarcely be ascertained without observing it in a fresh state both before and after the maturity of the seed.—*Benth.*

- Leaves pinnate with ovate petiolulate segments . . . . . 1. *L. fraxinifolia*.  
 Leaves undivided or once or twice pinnate, with sessile or decurrent segments usually reticulate and toothed.  
 Leaves mostly undivided, ovate to lanceolate, acutely toothed, rarely pinnate . . . . . 2. *L. ilicifolia*.  
 Leaves mostly once or twice pinnate . . . . . 3. *L. silaifolia*.

1. ***L. fraxinifolia*** (Ash-leaved), *F. v. M. Herb.; Benth. Fl. Austr.* v. 536. A tall shrub or small tree, the branches and foliage glabrous and drying black, the inflorescence slightly ferruginous-tomentose. Leaves mostly pinnate;

segments 3 to 7, ovate or ovate-lanceolate, acuminate, coarsely-toothed, contracted into a distinct petiolule, 2 to 3 or rarely 4 in. long, coriaceous and shining above, the veins not very conspicuous; occasionally the lower leaves are undivided, or on luxuriant shoots one or two of the segments are again divided. Racemes 6 to 8 in. long, solitary or several in a broad terminal panicle. Pedicels 3 or 4 lines long. Perianth glabrous, 4 to 5 lines long, the limb ovoid. Fruit only seen young.

Hab.: Rockingham Bay, *Dallachy*.

2. **L. ilicifolia** (holly-leaved), *R. Br. in Trans. Linn. Soc.* x. 200, *Prod.* 390, *Prot. Nov.* 33; *Benth. Fl. Austr.* v. 536. An erect branching shrub of several ft., growing out sometimes into a small tree, 60 ft. high according to *F. v. M. Fragm.* vii. 133, quite glabrous or the young shoots and inflorescence more or less ferruginous-pubescent. Leaves petiolate, ovate oblong or lanceolate, irregularly prickly-toothed or lobed, varying from 2 or 3 in. in some specimens, to twice that size in others, glabrous above and more or less reticulate, closely and shortly silky-pubescent underneath; the upper leaves often small and distant, and on barren shoots the leaves sometimes pinnate with numerous small sessile or decurrent lanceolate toothed segments. Racemes long and loose, simple or slightly branched. Pedicels  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Perianth glabrous or pubescent with small appressed hairs, the tube 3 to  $3\frac{1}{2}$  lines long. Fruit 1 to  $1\frac{1}{2}$  in. long.—*Meissn. in DC. Prod.* xiv. 447; *Bot. Mag.* t. 4023; *Embothrium ilicifolium*, *Poir. Dict. Suppl.* ii. 551; *L. Fraseri*, *R. Br. Prot. Nov.* 34; *Meissn. l.c.*

Hab.: From Mount Lindsay, *W. Hill*: inland along the N. S. Wales border.

The Queensland specimens are generally more ferruginous-pubescent than the southern ones; some of them have the leaves all small and nearly ovate.

3. **L. silaifolia** (Silaus-leaved), *R. Br. in Trans. Linn. Soc.* x. 199, *Prod.* 389, *Prot. Nov.* 33; *Benth. Fl. Austr.* v. 537. A shrub of 2 or 3 ft., glabrous or the young shoots and inflorescence minutely pubescent. Leaves mostly twice or thrice pinnate, rarely simply pinnate; segments sessile and decurrent, linear or lanceolate, usually deeply and sharply toothed, narrow or broad, long or short, the whole leaf usually 4 to 8 in. long and broad, or the lower ones larger, the reticulations obscure or prominent. Racemes terminal, long and loose, simple or branched, the flowers larger than in the preceding species. Pedicels  $\frac{1}{4}$  to  $\frac{1}{2}$  in., perianth white, 7 to 8 lines long.—Fruit about 1 in. long, flatly expanding with the style persistent, the stipes about 5 lines long.—*Meissn. in DC. Prod.* xiv. 448; *Bot. Mag.* t. 1272; *Embothrium silaifolium*, *Sm. Specim. Bot. Nov. Holl.* 23, t. 8; *F. herbaceum*, *Cav. Ic.* iv. 58; t. 334; *F. crithmifolium*, *Sm. (Steud)*; *Tricondylus silaifolius*, *Knight. Prot.* 122.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*. Common in southern localities.

Var. *induta*, *F. v. Muell.* Leaves silky-pubescent underneath, passing into the cut-leaved forms of *L. ilicifolia*.—Brisbane River, Moreton Bay, *Leichhardt, F. v. Mueller*.

## 22. EMBOTHRIUM, *Forst.*

(From *en*, in, and *bothrion*, a little pit; referring to the pollen-cases or anthers.)

Flowers hermaphrodite, slightly irregular. Perianth-tube cylindrical at first then splitting, limb ovoid or globose, oblique or recurved, segments loose in the expanded flower. Anthers sessile in the concave lamina, ovate, connective not produced over the cells. Hypogynous disk unilateral, semiannular, fleshy, entire or obscurely 2 or 3 lobed. Ovary long stipitate, narrow. Style-point oblong-fusiform or oblique-subdisciform; stigma small terminal or in the centre

of the disk. Ovules numerous, ascending, imbricate in 2-series. Follicles stipitate, oblong, coriaceous, subwoody. Seeds 2 seriate, imbricate, plano-compressed, samaroid wing terminal oblong.

1. **E. Wickhami** (after J. C. Wickham), *F. v. M. Fragm.* viii. 164 and ix. 194. "Red Silky Oak." A tall tree. Leaves ovate, oblong, thick coriaceous 2 to 6 in. long,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. broad, entire, veins immersed, brown on the underside. Petioles about 1 in. long. Flowers in corymbs at the end of the branchlets or in the upper axils; peduncle short. Pedicels geminate, 1 to  $1\frac{3}{4}$  in. long; bracts linear-subulate 1 to  $1\frac{1}{2}$  line long, deciduous. Perianth about 1 in. long, deep red, tube split on one side, slightly curved, limb before expanding oblique-globose, about  $1\frac{1}{2}$  line long, lobes, more or less coherent. Anthers sessile, round-ovate, blunt opening widely,  $\frac{2}{3}$  line long. Hypogynous disk long, horseshoe-shaped. Stipes of ovary about 3 lines long. Style about 9 lines long. Ovules 8 to 10 biseriate. Fruit cylindrical, 3 to 4 in. long, the terminal wing of seed broad and truncate at the end.—*Ql. Agri. Journ.* v. Pl. 14, 111.

Hab: Bellenden Ker Range, *W. Hill* (F. v. M.); Barron River, *J. F. Bailey*.

### 23. **BANKSIA**, Linn. f.

(After Sir Joseph Banks.)

Flowers hermaphrodite. Perianth regular or nearly so, straight or curved, the slender tube opening equally or along the lower-side only, the limb ovoid oblong or linear, the laminae remaining long coherent, or rarely separating as the tube opens. Anthers narrow, sessile in the concave laminae, the connective thick, usually very shortly produced beyond the cells. Hypogynous scales 4, very thin and membranous (rarely deficient?). Ovary very small and sessile, style usually longer than the perianth, rigid, curved and protruding from the slit in the perianth-tube until the end is set free by the separation of the laminae, and then either straightened or remaining hooked or curved, rarely straight from the first and not exceeding the perianth; the stigmatic end on a level with the anthers, of a different texture but smooth, or striate and furrowed, continuous with the style or with a prominent rim at the base, the real stigma small and terminal; ovules 2, collaterally attached about the middle. Fruit a compressed capsule, opening at the broad end (or rather outer margin, for the scar of the style is lateral) in two hard often woody horizontal valves. Seeds usually 2, compressed, with a terminal membranous wing broad and rounded like the valves, the seeds separated by a plate of the same shape (the consolidated outer integuments of the inner side of the two seeds) free from the ripe seeds, simple) completely consolidated) between the nuclei, double (remaining distinct) between the wings.—Trees or shrubs. Leaves alternate or rarely verticillate or nearly so, usually narrow, entire toothed pinnatifid or pinnate, with numerous (rarely few) short teeth lobes or segments, the primary veins numerous and transverse, rarely inconspicuous or irregular and the minute reticulations numerous on the under surface, with a minute tomentum rarely wanting in the areole, and sometimes white and covering the whole under surface, the upper surface almost always glabrous and smooth. Flowers sessile in pairs, in dense terminal cylindrical oblong or globular spikes, either terminal and sessile above the last leaves or rarely lateral or on short lateral branches; each pair of flowers subtended by one bract and two lateral rather smaller bracteoles, both bracts and bracteoles densely woolly-villous on the sides, the tips glabrous tomentose or villous, either clavate and obtuse or truncate, or shortly acuminate, always densely imbricate in parallel spiral or rarely vertical lines. Perianth-tube very slender and entire within the bracts, ultimately splitting beyond them. In fruit the bracts and bracteoles become consolidated with the rhachis into a thick woody cone, either covered with the withered remains of the perianths amongst which

the capsules are entirely concealed, or, where the flowers are wholly deciduous, the valves of the capsules protrude more or less beyond the bracts, the lower indelhiscent portion containing the nuclei of the seeds remaining imbedded among the bracts. The proportion of perfect capsules is usually very small in relation to the number of flowers, of which there are often from 500 to above 1000 in the same spike.

The genus is endemic in Australia, and the greater number of species are Western.

SECT. 1. **Oncostylis**.—Leaves linear or rarely lanceolate, with revolute margins or nearly flat but very white underneath, entire denticulate or pinnate with small numerous regular segments. Style remaining hooked after the perianth-limb has opened, the stigmatic end very small.

Perianth-tube more than half as long as the style, silky as well as the limb.

Leaves (about  $\frac{1}{2}$  in.) very narrow with closely revolute entire margins . . . 1. *B. ericifolia*.

Leaves ( $\frac{1}{2}$  to  $\frac{3}{4}$  in.) linear, more open, showing the white under surface, denticulate to the base or rarely entire . . . 2. *B. collina*.

SECT. 2. **Eubanksia**.—Leaves linear-lanceolate, oblong or cuneate, with recurved or revolute, entire or dentate margins, white underneath. Style at first curved, straight and very spreading or reflexed after the perianth-limb has opened, the stigmatic end small, not striate.

Leaves (mostly 3 to 6 in.) entire or rarely toothed, with transverse primary veins underneath, usually but not much more prominent than the reticulations and white like them . . . 3. *B. integrifolia*.

Leaves (mostly 4 to 8 in.) broad, coarsely toothed, the transverse primary veins prominent underneath and not so white as the reticulations . . . 4. *B. dentata*.

(*B. latifolia* has nearly the style and flowers of *Eubanksia*, but flat leaves not white underneath.)

SECT. 3. **Orthostylis**.—Leaves flat or undulate, serrate, pinnatifid or pinnate, with short lobes or segments. Perianth usually straight. Style, after the perianth-limb has opened, curved upwards near the base, then straight and erect, the stigmatic end prominently angled and furrowed or striate.

Leaves 2 to 3 in. broad, 4 to 5 in. long, irregularly toothed. Style-end of

*Eubanksia* . . . 5. *B. latifolia*.

Leaves 3 to 6 in. long,  $\frac{3}{4}$  to 1 in. broad, regularly serrate. Style-end ovoid, very short . . . 6. *B. emula*.

1. **B. ericifolia** (leaves heath-like). *Linn. f. Suppl.* 127; *Benth. Fl. Austr.* v. 547. A tall shrub or small tree of 12 to 14 ft., glabrous except the inflorescence. Leaves crowded, narrow-linear, truncate or notched at the end and sometimes with an intermediate point, otherwise entire with closely revolute margins, rarely exceeding  $\frac{1}{2}$  in. Spikes cylindrical, 6 to 10 in. long. Bracts with broad shortly acuminate silky-pubescent tips. Perianth yellow, silky, the tube  $\frac{3}{4}$  in. long, the limb ovoid. Style about 1 in. long, hooked, with a very short thick stigmatic end. Fruiting cones long and cylindrical. Capsules scarcely protruding, villous but often becoming glabrous, the flat top  $\frac{3}{4}$  to 1 in. broad and 4 or lines thick.—R. Br. in *Trans. Linn. Soc.* x. 203, *Prod.* 391; Meissn. in *DC. Prod.* xiv. 453; Cav. Ic. vi. t. 538; Andr. Bot. Rep. t. 156; Bot. Mag. t. 738; Bail. Hist. Pl. ii. 293, f. 227 to 229.

Hab.: Recorded for Queensland by F. r. M., without locality.

2. **B. collina** (growing on hills), *R. Br. in Trans. Linn. Soc.* x. 204, *Prod.* 392; *Benth. Fl. Austr.* v. 548. A tall erect shrub standing 8 to 12 ft., the young branches tomentose or villous. Leaves linear, always showing the white under surface, the margins only slightly recurved, more or less denticulate or rarely quite entire,  $1\frac{1}{2}$  to 5 in. long. Spikes oblong or cylindrical, 3 to 8 in. long. Bracts with broad flat or scarcely acuminate ends. Perianths silky, the tube above 1 in. long, the limb narrow ovoid. Style yellow or in one form the upper half deep-purple; longer than the perianth, hooked, with a very small stigmatic end. Fruiting cone cylindrical. Capsules thick and scarcely protruding, quite glabrous.—Meissn. in *DC. Prod.* xiv. 454; *B. ledifolia*, A. Cunn. Herb.; *B. Cunninghamii*, Sieb. in *Spreng. Syst. Cur. Post.* 47, and in

Roem. and Schult. Syst. iii. Mant. 239; R. Br. Prot. Nov. 35; Meissn. in DC. Prod. xiv. 454; Reich. Iconogr. Exot. t. 81; *B. littoralis*, Lindl. Bot. Reg. t. 1363, Grah. in Bot. Mag. t. 3060, not of R. Br.; *B. prionophylla*, F. v. M. 1st Gen. Rep. 17; *B. marginata* var. *macrostachya*, Hort. Petrop.

Hab.: Glasshouses, Moreton Bay, *C. Moore*; and many other southern coast localities.

The typical form of *B. spinulosa*, Sm., so far as at present known, is confined to N. S. Wales, while *B. collina*, R. Br., besides Queensland, is met with in N. S. Wales and Victoria, but from the examinations of Queensland specimens of *B. collina* and the N. S. Wales one of *B. spinulosa* I find nothing to keep the two as distinct species.

When the leaves are small and rather broad, they are somewhat like those of *B. marginata*, but the species is readily distinguished by the large flowers, hooked style and thick capsules.—*Benth.*

3. ***B. integrifolia*** (leaves often entire), *Linn. F. Suppl.* 127; *Benth. Fl. Austr.* v. 554. Honeysuckle. "Pomera," and "Tchoomeroo," Stradbroke Island, *Watkins*. "Burthargong," Bandaberg, *Keys*. A tree attaining sometimes a considerable size, the young branches closely tomentose. Leaves scattered, sometimes irregularly verticillate, oblong cuneate or lanceolate, quite entire or irregularly toothed, tapering into a short petiole, 3 to 4 in. long in some specimens, twice that length in others, especially the northern ones,  $\frac{1}{2}$  to near 1 in. broad, white underneath, with numerous transverse veins and reticulations not very prominent; the young shoots are also sometimes tomentose or villous with richly coloured fulvous almost woolly hairs persisting on the under side till the leaves are nearly full grown. Spikes oblong or cylindrical, 3 to 6 in. long. Bracts tomentose at the end. Perianth usually about 1 in. long, silky. Style straightening after the perianth-laminae have separated and usually very spreading or reflexed. Fruiting cone oblong, cylindrical, the capsules prominent.—R. Br. in Trans. Linn. Soc. x. 206, Prod. 393; Meissn. in DC. Prod. xiv. 456; Cav. Ic. vi. t. 546; Bot. Mag. t. 2770; *B. spicata*, Gaertn. Fr. i. 221, t. 48; *B. olivifolia*, Cav. Anal. Hist. Nat. i. 228, t. 14, Ic. vi. 30, t. 545; *B. macrophylla*, Link. Enum. Hort. Berol. i. 116; *B. compar.* R. Br. in Trans. Linn. Soc. x. 207, Prod. 393; Meissn. in DC. Prod. xiv. 457.

Hab.: Keppel Bay, *R. Brown*, *O'Shanesy*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others. Condamine River, *Leichhardt*; Mount Archer, *Bowman*; Rockhampton and Rockingham Bay, *Dallocky*.—The greater number of these northern specimens have remarkably long leaves, sometimes 8 to 10 in. long and  $\frac{3}{4}$  in. wide, and constitute the *B. compar.* Br. They have also usually rather larger flowers, but neither character is at all constant, and R. Brown had himself referred his specimens to *B. integrifolia*.—*Benth.*

Wood pinkish, close in the grain and nicely marked; used for shoemakers' lasts, cabinet-work, and in boatbuilding.—*Bailey's Cat. Ql. Woods*, No. 348.

Var. *paludosa*. Perianth 7 to 8 lines long, leaves of one of the common short-leaved forms of *B. integrifolia*.—*B. paludosa*, R. Br. in Trans. Linn. Soc. x. 207; Prod. 394; Meissn. in DC. Prod. xv. 457; Bot. Reg. t. 697; Lodd. Bot. Cab. t. 392.—Port Jackson, *R. Brown*, *Sieber*, n. 5. Distributed also from the Botanical Garden, St. Petersburg, as *B. integrifolia*.

4. ***B. dentata*** (toothed), *Linn. F. Suppl.* 127; *Benth. Fl. Austr.* v. 555. A small tree of 15 to 20 ft. Leaves shortly petiolate, cuneate-oblong, 4 to 8 in. long, 1 to 2 in. broad, irregularly toothed, the margins slightly recurved, white underneath with the primary transverse veins more prominent than in *B. integrifolia* and not so white. Spikes oblong or cylindrical, usually larger than in *B. integrifolia* but the flowers in all other respects as well as the fruits entirely those of *B. integrifolia*. Styles about  $1\frac{1}{2}$  in. long, becoming straight, with a small narrow stigmatic end.—R. Br. in Trans. Linn. Soc. x. 210, Prod. 396; Meissn. in DC. Prod. xiv. 462; F. v. M. Fragn. vii. 57.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks* and *Solander*, *A. Cunningham*.

Wood of a dark-red colour, hard, close-grained and prettily marked.—*Bailey's Cat. Ql. Woods*, No. 349.

5. **B. latifolia** (broad-leaved), *R. Br. in Trans. Linn. Soc. x.* 208, *Prod.* 394; *Benth. Fl. Austr. v.* 555. "Bumbar," Stradbroke Island, *Watkins*. A low but stout shrub, the branches densely tomentose. Leaves shortly petiolate, obovate-oblong, often truncate, irregularly serrate with short usually prickly teeth, contracted at the base, 4 to 8 in. long.  $1\frac{1}{2}$  to 3 in. broad, flat, minutely tomentose but not white underneath, with prominent transverse veins and reticulations. Spikes oblong-cylindrical, 3 to 5 in. long. Perianth slender, about 1 in. long, the tube shortly silky-pubescent, the limb glabrous, narrow, acute, scarcely 2 lines long. Style becoming straight and spreading as in *Eubanksia*, with a very small stigmatic end. Fruiting cones large and thick; capsules villous, not thick, protruding, about 6 or 7 lines diameter.—*Meissn. in DC. Prod. xiv.* 460; *Bot. Mag. t.* 2406; *B. robusta*, *Cav. Anal. Hist. Nat. i.* 226, *lc. vi.* 29, *t.* 543; *B. uncigera* and *B. dilleniasfolia*, *Knight, Prot.* 112, 113; *B. jagifolia*, *Hoffmsg.; Roem. and Schult. Syst. iii. Mant.* 379 (*Meissn.*).

Hab.: Coastal marshes of the south.

6. **B. æmula** (rivalling), *R. Br. in Trans. Linn. Soc. x.* 210, *Prod.* 395; *Benth. Fl. Austr. v.* 556. "Mintie," Stradbroke Island, *Watkins*. "Wallum," Wide Bay, *Palmer*. A shrub or tree closely allied to *B. serrata* and difficult to distinguish from it except by the stigmatic end of the style which is very much shorter and ovoid. The flowers are also of a yellowish green without the bluish grey tinge of *B. serrata*. The spikes are usually not so thick, the foliage precisely the same. Capsules at least as large as in *B. serrata*, the tomentum easily wearing off.—*Meissn. in DC. Prod. xiv.* 461; *Bot. Mag. t.* 2671; *Bot. Rep. t.* 638; *B. serrata*, *Cav. Ic. vi.* 27, *t.* 540, not of *Linn. f.*; *B. serratifolia*, *Salisb. Prod.* 51 or *B. serratifolia*, *Knight, Prot.* 112 (*R. Br.*); *B. elatior*, *R. Br. in Trans. Linn. Soc. x.* 209, *Prod.* 395; *Meissn. in DC. Prod. xiv.* 458; *B. undulata*, *Lincl. Bot. Reg. t.* 1316.

Hab.: Sandy Cape, *R. Brown*; Stradbroke Island, Moreton Bay, *A. Cunningham*.

Wood deep-red, coarse-grained, prettily marked, shrinks unequally in drying; an excellent wood for the cabinetmaker.—*Bailey's Cat. Ql. Woods, No.* 351.

Honey of the flowers gathered and eaten by the natives of Wide Bay.—*Palmer*.

## ORDER CXII. THYMELÆACEÆ.

Flowers hermaphrodite or rarely diœcious. Perianth simple, tubular or campanulate, 4-lobed or in genera not Australian 5-lobed, usually regular, the lobes imbricate in the bud, with the addition in many genera not Australian of small scales, alternating with the lobes at their base. Stamens either 2 only, or as many as the lobes of the perianth or twice as many; filaments inserted in the throat or within the tube; anthers with 2 parallel cells opening longitudinally. Ovary free within the base of the perianth, 1 or rarely 2-celled, with 1 or rarely 2 or 3 pendulous anatropous ovules. Style simple, with a terminal entire capitate or truncate stigma. Fruit an indehiscent nut drupe or berry, or rarely a 2-valved capsule. Seed with or without albumen; embryo straight, with a superior radicle.—Leaves alternate or opposite, always simple and entire. Flowers in terminal or axillary clusters heads umbels racemes or spikes, rarely solitary often surrounded by an involucre of 4 or more bracts, differing more or less from the stem-leaves.

A considerable Order, widely distributed over most parts of the globe.

Stamens 2. Perianth-lobes 4 . . . . . 1. PIMELEA.

Stamens twice as many as the perianth-lobes. Shrubs or small trees.

Ovary 1-celled, with 1 ovule. Hypogynous scales 4, free or united in pairs 2. WINSTRÖMIA.

Ovary 2-celled, with 1 ovule in each cell. Hypogynous scales united in a short cup . . . . . 3. PHALERIA.

1. **PIMELEA**, Banks and Soland.

(From *pimela*, fat; alluding to the oily seeds.)

(*Thecanthes*, Wikstr.; *Gymnococca*, Fisch. et Meyer; *Heterolæna* and *Calyptrostegia*, C. A. Mey; *Macrostegia*, Turcz.)

Perianth tubular, with a spreading or rarely erect 4-lobed limb, without scales but often slightly thickened or folded round the throat. Stamens 2, inserted in the throat opposite the 2 outer perianth-lobes. No hypogynous scales. Ovary 1-celled, with 1 pendulous ovule. Style elongated, attached to one side of the ovary immediately below the apex. Fruit a small drupe, with a membranous or succulent epicarp, the endocarp nut-like, crustaceous, often hooked at the top. Seed pendulous with a membranous testa; albumen scanty or copious; cotyledons broad or narrow, rather thick, longer than the radicle.—Shrubs undershrubs or herbs. Leaves opposite or alternate. Inflorescence varied within the limits of the Order, but never umbellate. Perianth white pink or yellowish, often silky-villous.

The genus is limited to Australasia.  
Several species of this genus have been considered poisonous to stock.

SECT. 1. **Thecanthes**.—*Involucral bracts united into a 4-lobed cup. Perianth-tube glabrous, not circumsciss.*—*Glabrous annuals.*

- Involucral lobes reaching to about the middle, with the midrib alone prominent. Filaments much shorter than the perianth-lobes. Flowers red . . . . . 1. *P. cornucopie*.  
Involucral lobes reaching nearly to the base, several-nerved and longer than the flowers. Filaments much shorter than the perianth-lobes. Flowers red . . . . . 2. *P. sanguinea*.

SECT. 2. **Calyptrostegia**.—*Flowers hermaphrodite or in some specimens female by abortion. Perianth-tube after flowering (except in P. leptostachya) circumsciss above the ovary, leaving the lower portion only persistent round the fruit. Anthers with a narrow connective, the cells very distinct and after they open placed back to back.*

SUBSECT. 1. **Calyptridium**.—*Flower-heads terminal, with 4-6 broad persistent involucral bracts.*—*Shrubs, with opposite leaves.*

*Leaves more or less concave, glabrous as well as the stem. Cotyledons usually broad.*

- Perianth nearly glabrous at the base, hairy upwards. Hairs of the receptacle very long . . . . . 3. *P. glauca*.  
Perianth hairy throughout. Hairs of the receptacle short. Leaves mostly oblong, obtuse. Bracts scarcely acuminate. Leaves with 1 or 2 prominent marginal or submarginal veins underneath. Flower-heads erect. Involucral bracts with a prominent midrib . . . . . 4. *P. collina*.

*Glabrous silky-hairy or tomentose. Leaves flat or with the margins more or less recurved. Cotyledons usually broad.*

- Branches and leaves glabrous.  
Leaves narrow, under lin. long . . . . . 5. *P. linifolia*.  
Leaves oblong or broad, above lin. long . . . . . 6. *P. linguistina*.

SUBSECT. 2. **Choristachys**.—*Flowers in clusters spikes or racemes, without involucre, or the bracts not broader than the leaves and very deciduous. Leaves flat or with slightly recurved margins.*—*Eastern or tropical species.*

- Leaves opposite. Flowers large, red, in a terminal dense spike . . . . . 7. *P. hamatostachya*.  
Leaves mostly alternate, silky-villous.  
Leaves rather broad, 1½-3in. long. Flowers shortly spicate. Perianth 3-4 lines long . . . . . 8. *P. latifolia*.  
Leaves linear. Perianth not 2 lines long.  
Fruiting spike shortly capitate . . . . . 9. *P. simplex*.  
Fruiting spike long and interrupted.  
Perianth-hairs silky appressed . . . . . 10. *P. sericostachya*.  
Perianth-hairs rigid and spreading . . . . . 11. *P. trichostachya*.  
Leaves alternate, glabrous or slightly silky. Fruiting spike long and interrupted. Perianth small, not circumsciss . . . . . 12. *P. leptostachya*.



SECT. 3. **Dithalamia**.—Flowers (small) strictly diœcious. Male perianth with a slender tube; anthers with a narrow connective, the cells very distinct, and after they are open placed back to back; ovary abortive or rudimentary. Female perianth wholly persistent with small lobes divided to the ovary, or rarely with a short tube and tardily circumsciss. Fruit not at all, or slightly succulent. Leaves opposite, flat, or nearly so.

Flower-clusters all axillary. Lateral veins nearly parallel to the midrib. Male perianth-tube 4 to 5 lines long . . . . . 13. *P. leptospermoides*.  
Flower-clusters terminal, or in the forks.

Leaves linear-lanceolate, mostly  $\frac{1}{2}$  to lin. long.

Flowers more or less silky hairy . . . . . 14. *P. microcephala*.

Flowers quite glabrous . . . . . 15. *P. pauciflora*.

Erect, shortly dichotomous shrubs. Flowers silky-villous. Leaves mostly obtuse. Female perianth-tube not produced above the ovary 16. *P. flara*.

SECT. 4. **Epallage**.—Flowers hermaphrodite or more or less diœcious. Perianth-tube usually circumsciss after flowering, leaving the lower portion persistent round the fruit. Anthers rather flat, with a broad dorsal connective, the cells closely parallel on the inner face, the whole anther usually rolled back after flowering. Flowers in clusters or heads, rarely solitary, or in dense oblong spikes.

Flowers strictly diœcious. Leaves alternate, softly silky-villous. Flowers solitary in the upper axils. Female perianth shortly and equally silky-villous . . . . . 17. *P. Bowmanii*.

Flowers hermaphrodite or in some specimens female.

Softly villous plants. Flowers small, bracts 2 or rarely 4, unequal and deciduous.

Hairs spreading. Leaves ovate-lanceolate, sessile . . . . . 18. *P. penicillaris*.

Hairs appressed. Leaves mostly oblong, rarely  $\frac{1}{2}$  in. long . . . . . 19. *P. curviflora*.

Hairs scarcely spreading. Leaves ovate or oblong,  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. long.

Flowers rather larger. . . . . 20. *P. altior*.

1. ***P. cornucopiæ*** (resembling the Horn of Plenty), *Vahl. Enum. i. 305; Benth. Fl. Austr. vi. 6*. An erect glabrous rather stiff annual of about 1ft. Leaves alternate or the lower ones opposite, sessile or nearly so, lanceolate or oblong-linear, obtuse or nearly acute, mostly  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long. Flower-heads on a terminal peduncle. Involucre turbinate with a long tapering base, about  $\frac{1}{2}$  in. diameter, divided to near the middle into broad acute lobes, with the midribs alone conspicuous. Flowers numerous, usually whitish, on short flattened pedicels within the involucre at or near its base. Perianths scarcely protruding beyond the involucre lobes, the slender tube about 2 lines long, circumsciss after flowering shortly above the ovary, the lobes small and obtuse. Filaments very short; anthers ovate, with a narrow connective. Epicarp membranous. Seed with a scanty albumen and broad cotyledons.—*R. Br. Prod. 359; Meissn. in DC. Prod. xiv. 496; Thecanthes cornucopiæ, Wikstr. in Trans. R. Acad. Stockh. 1818, 271; Calypstrosteugia cornucopiæ, Endl. Gen. Pl. Suppl. iv. part. 2, 60*.

Hab.: Endeavour River, *Banks and Solander, A. Cunningham*; Port Curtis, Keppel Bay, Shoalwater Bay, Broadsound, *R. Brown*; Cape York, *Daemel*; Port Denison, *Fitzalan*; Burdekin River, *Bowman*; Rockhampton and Rockingham Bay, *Thozet* and others.

2. ***P. sanguinea*** (flowers blood-red), *F. v. M. Fragm. i. 84, and vii. 3; Benth. Fl. Austr. vi. 7*. A glabrous annual, at first simple, but soon branching from the base into numerous decumbent or ascending simple or slightly branched stems, seldom exceeding 6in. Leaves more crowded than in the allied species, oblong-linear or lanceolate, obtuse or rather acute,  $\frac{1}{2}$  to  $\frac{3}{4}$  or rarely 1in. long. Flower-heads shortly pedunculate or almost sessile above the last leaves. Involucre rather broad, divided nearly to the base into ovate acute lobes of about  $\frac{1}{2}$  in., the midrib prominent and a few faint lateral veins at the base. Perianths red, much shorter than the involucre, the tube not 2 lines long, the lobes scarcely above  $\frac{1}{2}$  line and obtuse. Stamens shorter than the lobes, with the short anthers of *P. cornucopiæ*.

Hab.: Upper Roper River, *F. v. Mueller*; Cape River, *Bowman*; Norman and Gilbert Rivers, *Gulliver*.

A specimen from alluvial flats, Mount King, Glenelg district, *Martin*, referred by *F. v. Mueller, Fragm., vii. 3*, to *P. sanguinea*, with the evidently red flowers of that species, has the habit and involucre of *P. cornucopiæ*; but it is insufficient to determine absolutely its affinities.

3. *P. glauca* (grey), *R. Br. Prod.* 360; *Benth. Fl. Austr.* vi. 15. An erect much-branched shrub, from  $\frac{1}{2}$  to  $1\frac{1}{2}$  ft. high, glabrous except the inflorescence. Leaves opposite, from ovate to oblong-lanceolate or almost linear, sometimes all under  $\frac{1}{2}$  in., sometimes  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, or even longer, flat or concave, with the midrib prominent underneath. Flower-heads globular; involucre bracts usually 4, ovate or ovate-lanceolate, shorter than the perianth, sometimes not much, sometimes considerably broader than the stem-leaves, the inner ones ciliate on the margin and more or less silky-hairy inside. Receptacle densely covered with long hairs. Perianth-tube 4 to 5 lines long, circumsciss after flowering considerably above the ovary, the persistent portion rarely glabrous or sprinkled only with hairs, the deciduous portion silky-villous, the lobes about  $1\frac{1}{2}$  lines long. Filaments usually half the length of the lobes; anthers oblong, with a narrow connective. Fruit sessile or nearly so within the perianth, the epicarp membranous. Seed not seen perfectly ripe, but the cotyledons appear to be rather broad.—Meissn. in *DC. Prod.* xiv. 501; Rudge in *Trans. Linn. Soc.* x. 286, t. 13; Hook. f. *Fl. Tasm.* i. 334; Lodd. *Bot. Cab.* t. 1611; *P. humilis*, Lindl. *Bot. Reg.* t. 1268 not of *R. Br.*; *P. intermedia*, Lindl. *Bot. Reg.* t. 1439; Maund, *Botanist*, v. t. 243; Meissn. in *DC. Prod.* xiv. 501; *Calypstrosteia glauca* and *C. intermedia*, C. A. Mey. in *Bull. Acad. Petrop.* iv. (1845) 74; *P. campicola*, A. Cunn. *Herb.*; *P. linifolia*, var. ? *subnervosa*, Meissn. in *DC. Prod.* xiv. 498, (at least as to Cunningham's plant); *P. Preissii*, Schlecht. in *Linnaea*, xx. 581, not of Meissn.; *P. Schlechtendahliana*, Meissn. in *Bot. Zeit.* 1848, 394, and in *DC. Prod.* xiv. 500; *Calypstrosteia Schlechtendahliana*, Walp. *Ann.* iii. 324; *P. myrtifolia*, Schlecht. l.c. 582.

Hab.: Plains of the Condamine, *Leichhardt*; Darling Downs, *Law*; Dee River, *Bowman*; Rockhampton, *Dallachy*; Burnett River, *Italy*; Stanthorpe.

This species is sometimes confounded with the *P. linifolia*, the most ready distinction is in the persistent base of the perianth being nearly glabrous but half concealed by the long hairs of the receptacle. The leaves are also usually concave when dry, but this distinction cannot always be safely relied on.—*Benth.*

4. *P. collina* (of hills), *R. Br. Prod.* 359; *Benth. Fl. Austr.* vi. 16. An erect shrub, glabrous except the inflorescence, closely resembling *P. linifolia*, but the leaves are slightly concave with the lateral veins more prominent underneath, running into a marginal nerve when the leaves are narrow, more pinnate when the leaves are broader, the involucre bracts are also usually more rigid and prominently veined. It differs from the narrow leaved forms of *P. glauca* in the involucre bracts being glabrous inside as well as out, the short hairs to the receptacle, and the perianth usually villous from the base.—Meissn. in *DC. Prod.* xiv. 497; *P. marginata*, Meissn. l.c.; *P. colorans*, *Mitch. Trop. Austr.* 362 not of A. Cunn.; *P. Mitchellii*, Meissn. in *DC. Prod.* xiv. 506.

Hab.: Port Bowen, *R. Brown*; Maranoa River, *Mitchell*; dividing range between Flinders and Burdekin Rivers, *Thorset*.

5. *P. linifolia* (Flax-leaved), *Sm. Bot. N. Holl.* 31, t. 11; *Benth. Fl. Austr.* vi. 17. An erect shrub, from under 1 ft. to 2 or 3 ft. high, glabrous except the inflorescence, the branches usually slender and virgate. Leaves opposite, on very short petioles, linear or oblong, passing also into linear spatulate or linear-lanceolate, from under  $\frac{1}{2}$  in. to about 1 in. long, nearly flat, the margins in the dry state usually slightly recurved and rather convex than concave. Flower-heads terminal, globular, erect; involucre bracts 4, ovate or ovate-lanceolate, often nearly as long as the flowers, glabrous inside as well as out, rather thin, the midrib not very prominent. Receptacle shortly villous. Perianth-tube 4 to 6 lines long, silky-villous from the base, circumsciss rather above the ovary, the lobes 1 to  $1\frac{1}{2}$  line long. Filaments usually about half the length of the lobes; anthers oblong, with a narrow connective, the cells when opened placed back to





F.C. Willis, Del. et Lith.

*Pimelea haematostachya*, F.v.M.

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back. Fruiting base of the perianth not acuminate; epicarp membranous. Seed oblong; albumen scanty; cotyledons ovate-oblong, flat but rather thick.—R. Br. Prod. 359; Meissn. in DC. Prod. xiv. 497; Hook. f. Fl. Tasm. i. 334; Bonpl. Jard. Malm. t. 31; Bot. Mag. t. 891; Lodd. Bot. Cab. t. 1668; *P. filamentosa*, Rudge in Trans. Linn. Soc. x. 287, t. 14; *P. involucrata*, Herb. Banks; *Passerina involucrata*, Thumb. Cat. Mus. Nat. Acad. Ups. xiii. 106; *Calyptrostegia linifolia*, C. A. Mey. in Bull. Acad. Petrop. iv. (1845) 74; *P. paludosa*, R. Br. Prod. 360, Meissn. in DC. Prod. xiv. 499; *P. collina*, A. Cunn. Herb. (partly); *P. rigida*, Meissn. in DC. Prod. xiv. 502; *P. linoides*, A. Cunn. in Field, N. S. Wales, 326; *Calyptrostegia linoides*, Endl. Gen. Suppl. iv. part 2, 61; *P. Lindleyana*, Meissn. in DC. Prod. xiv. 499 (partly).

Hab.: Brisbane River, Moreton Bay, *A. Cunningham* and many others; Rockingham Bay, *Dillwyn*.

6. ***P. ligustrina*** (Ligustrum-like), *Labill. Pl. Nor. Holl.* i. 9, t. 3; *Benth. Fl. Austr.* vi. 18. An erect shrub, attaining in the ordinary form 5 or 6 ft., glabrous except the inflorescence or the young shoots slightly silky-hairy. Leaves opposite, from ovate to oblong or elliptical, rather thin, 1-nerved and more or less distinctly penniveined, 1 to 1½ in. long or on luxuriant shoots twice that size. Flower heads rather large, globular; involucre bracts in the typical form 4 or rarely 5 or 6, very broad, as long as the perianth-tubes, glabrous or nearly so. Flowers hermaphrodite or in some specimens female with shorter perianths, but in both cases apparently fertile. Perianth-tube fully 5 lines long in the hermaphrodite flowers, shorter in the females, in both more or less silky-hairy and circumsciss above the ovary after flowering, the lobes about 1½ lines long. Filaments in the hermaphrodite flowers nearly as long as the lobes, the anthers oblong, with a narrow connective; in the females the anthers small empty on short filaments and the style longer. Fruit acuminate, the beak longer in the hermaphrodite than in the female specimens. Epicarp membranous. Seed and embryo as in *P. linifolia*.—R. Br. Prod. 360; Meissn. in DC. Prod. xiv. 505; Hook. f. Fl. Tasm. i. 333; *Calyptrostegia ligustrina*, C. A. Mey. in Bull. Acad. Petrop. iv. (1845) 74; *P. elata*, F. v. M. First Gen. Rep. 17; Meissn. in *Linnaea*, xxvi. 349, and in DC. Prod. xiv. 505.

Hab.: Mount Mistake.

7. ***P. hæmatostachya*** (spikes blood-red), *F. v. M. Fragm.* i. 84; *Benth. Fl. Austr.* vi. 22. An erect perennial of 1 to 2 ft., perfectly glabrous except the inflorescence, somewhat glaucous, not much branched. Leaves opposite, sessile or nearly so, oblong or lanceolate, obtuse, mostly 1 to 2 in. long. Flower-heads pedunculate above the last stem-leaves, large and hirsute, at first globular, but soon lengthening into a dense spike of 2 to 4 in. Involucre bracts 4 to 8, very deciduous so as to be seen only on the very young head, linear to oval-oblong, membranous and hairy. Flowers of a blood-red colour, numerous and crowded. Perianth slightly silky-hairy, the slender tube above ½ in. long, circumsciss above the ovary after flowering, the lobes about 2 lines long. Filaments at least as long as the lobes; anthers oblong, with a narrow connective, the cells when open placed back to back. Fruit not succulent, the persistent base of the perianth very hairy, the epicarp membranous. Seeds with scanty albumen and broad cotyledons.

Hab.: Burdekin River and Peak Downs, *F. v. Mueller*; Dawson River, *Leichhardt*; Rockingham and Edgecombe Bays, *Dallachy*; Port Denison, *Fitzalan*; Nerkool Creek and Bowen River, *Bowman*; Suttor River, *Sutherland*; Rockhampton, *O'Shaunesy*, *Thozet*; and many other inland localities.

By some this species is considered the worst of the genus for poisoning sheep. It is, however, stated that if the ears of the sheep affected are slit soon after the poison has taken effect the animal's life may in most cases be saved.

8. **P. latifolia** (broad leaves), *R. Br. Prod.* 362; *Benth. Fl. Austr.* vi. 23. A spreading silky-hairy shrub or undershrub of 1 to 2ft. Leaves alternate, elliptical or lanceolate, acute, tapering into a very short petiole,  $1\frac{1}{2}$  to 3in. long, glabrous above, silky-hairy underneath. Flower-heads more or less lengthened into short spikes, shortly pedunculate above the last leaves, without involucre bracts, becoming lateral or in the forks of the branches by the elongation of the lateral shoots, the rhachis of the fruiting spike often  $\frac{1}{2}$ in. long. Perianth-tube about 2 lines long, circumsciss about the middle after flowering, leaving a bottle-shaped fruiting base, the lobes rather short and obtuse. Filaments short; anthers with a narrow connective, the cells when open placed back to back. Fruit shortly acuminate, epicarp membranous, endocarp more hooked at the end than in many species.—Meissn. in DC. *Prod.* xiv, 514.

Hab.: Cumberland Island, *R. Brown*; Port Denison, *Fitzalan*; Rockhampton, *Thozet*; head of the Dee River, *Bowman*; Mount Elliott and Mount Mueller, *Dallachy*.

9. **P. simplex** (simple), *F. v. M. in Linnæa*, xxv. 443; *Benth. Fl. Austr.* vi. 23. An erect slender branching annual of about 1ft., glabrous except the inflorescence and much resembling *P. trichostachya*. Leaves alternate, linear, mostly about  $\frac{1}{2}$ in. long. Flower-heads small, depressed-globular, surrounded when young by 2 to 4 deciduous involucre bracts like the stem-leaves but smaller, and remaining dense and compact after flowering, the hirsute rhachis not exceeding 2 lines. Flowers smaller than in *P. trichostachya*, the perianth-hairs shorter and less spreading, the tube much shorter above the ovary, but similarly circumsciss after flowering and the fruit the same.—Meissn. in *Linnæa*, xxvi. 350, and in DC. *Prod.* xiv. 511.

Hab.: Southern localities inland.

10. **P. sericostachya** (spikes silky), *F. v. M. Fragm.* iv. 162; *Benth. Fl. Austr.* vi. 24. Shrubby at the base, with erect branching stems, from under 1ft. to 2ft. high, the whole plant clothed with long silvery-silky hairs which soon disappear from the upper side of the leaves. Leaves alternate, lanceolate or oblong linear,  $\frac{1}{2}$  to 1in. long. Flowers very small, in heads compact when in very young bud, but soon lengthening into interrupted spikes often several inches long, always pedunculate above the last leaf, without involucre bracts. Perianth shortly silky-hairy, the tube slender, about 2 lines long, circumsciss above the ovary after flowering, the lobes about  $\frac{1}{2}$  line. Anthers abortive in some specimens, sessile in the bisexual flowers. In fruit the persistent base of the perianth enlarges to 3 lines; fruit acuminate, the epicarp membranous, the endocarp scarcely hooked.

Hab.: Sellheim River, *Bowman*; Newcastle Range, *W. E. Armit* (*F. v. M. Fragm.* xi. 47).

Var. *parvifolia*. Leaves mostly about 2 lines long.

11. **P. trichostachya** (spikes hairy), *Lindl. in Mitch. Trop. Austr.* 355; *Benth. Fl. Austr.* vi. 24. An erect slender branching annual of about 1ft., glabrous and glaucous except the inflorescence. Leaves alternate, linear, concave,  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long. Flower-heads at first short, but soon lengthening into a slender interrupted hairy spike or raceme of 1 to 2in., without any involucre bracts different from the stem-leaves, the flowers small yellow and very shortly pedicellate. Perianth not above 2 lines long, the tube circumsciss above the ovary after flowering, the persistent base clothed with long spreading hairs; the lobes not above  $\frac{1}{2}$  line long. Filaments short; anthers oblong with a narrow connective, the cells when open placed back to back. Fruit acuminate, the epicarp membranous.—Meissn. in DC. *Prod.* xiv. 514; *Calyptrastegia trichostachya*, Walp. *Ann.* iii. 325.

Hab.: On the Maranoa River, *Mitchell*; Bokhara Creek, *Leichhardt*; Darling Downs, *Law*.

12. **P. leptostachya** (spikes slender), *Benth. Fl. Austr.* vi. 24. A slender undershrub (or annual with a hard base?), much branched, with erect or ascending stems of  $\frac{1}{2}$  to 1 ft., glabrous or sprinkled with a few silky hairs especially on the inflorescence and flowers. Leaves alternate, lanceolate or oblong-linear,  $\frac{1}{2}$  to 1 in. long. Flowers small, in loose spikes scarcely forming a head when very young, and lengthening to 1 or  $1\frac{1}{2}$  in., without involucre bracts. Perianth about  $2\frac{1}{2}$  lines long, sprinkled with appressed hairs, not circumsciss after flowering, the lobes rather long, filaments short; anthers with a narrow connective, the cells placed back to back when open. Fruiting perianth about 3 lines long, bottle-shaped at the base, contracted into a short neck terminating in the persistent lobes. Fruit acuminate, the epicarp membranous, hairy at the apex, the endocarp tubercular-rugose, not hooked.

Hab.: Herbert's Creek and Rockhampton, *Bowman*.

13. **P. leptospermoides** (Leptospermum-like), *F. v. M. Fragm.* vii. 2; *Benth. Fl. Austr.* vi. 27. An erect shrub of 1 to 3 ft., slightly silky-hairy, the foliage of a pale almost glaucous hue. Leaves mostly alternate, oblong,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, glabrous above with 2 or 3 veins on each side of the midrib and nearly parallel to it prominent underneath. Flowers in terminal and axillary sessile clusters without involucre bracts different from the stem-leaves, those in the specimens seen all males. Perianth silky-hairy, with a slender tube 4 to 5 lines long and narrow lobes about 1 line. Anthers oblong, nearly sessile, the connective rather broad, but the cells quite distinct and at length placed almost back to back. Ovary apparently abortive.

Hab.: Cawarra, *Bowman*.—Until the fertile flowers have been observed, the affinities of this species must remain uncertain.

14. **P. microcephala** (flower-heads small), *R. Br. Prod.* 361; *Benth. Fl. Austr.* vi. 27. "Yackahber," St. George, *Wedd.* A much-branched spreading shrub, usually quite glabrous except the flowers, the branches rigid but slender. Leaves opposite, linear-lanceolate, acute or obtuse, mostly  $\frac{1}{4}$  to 1 in. long, or on some luxuriant shoots narrow and  $1\frac{1}{2}$  in. long, flat or concave. Flower-heads small, terminal, with 2 to 4 involucre bracts rather shorter and broader than the stem-leaves but variable. Flowers strictly diœcious. Male-perianth more or less silky-hairy, the tube very slender, fully 2 lines long, the lobes about one-third as long. Filaments very short; anthers with a narrow connective, the cells when open placed back to back. Female perianth very short and villous, the small erect lobes just protruding above the ovary, usually enlarged with the fruit, which is then 2 lines long and sometimes protrudes beyond the lobes. Epicarp membranous. Seed with a scanty albumen and broad cotyledons.—*Meissn.* in DC. *Prod.* xiv. 515; *P. distinctissima*, *F. v. Muell.* First Gen. Rep. 17; *Calyptrostegia microcephala*, *Endl. Gen. Pl. Suppl.* iv. part 2, 61.

Hab.: Curriwillingham, *Dalton*; Peak Downs, *Burkitt*.

15. **P. pauciflora** (few flowers), *R. Br. Prod.* 360; *Benth. Fl. Austr.* vi. 27. A much-branched glabrous shrub, attaining sometimes 8 or 10 ft., but often much lower, closely allied to and much resembling luxuriant specimens of *P. microcephala*, but usually more slender, with linear-lanceolate leaves. Flowers few in the head, and the perianth and receptacle quite glabrous, the male perianth not quite so slender as in *P. microcephala*, but the diœcious character and the structure of the flowers and fruits quite the same. The fruit is said to be red when ripe, but it does not appear to be at all succulent.—*Meissn.* in DC. *Prod.* xiv. 515; *Hook. f. Fl. Tasm.* i. 335; *Lodd. Bot. Cab.* t. 179.

Hab.: Dividing Range, Moreton Bay, *A. Cunningham*; Mount Lindsay, *W. Hill*; Warwick, *Beckler*; Wide Bay, *Bidwill*.

16. **P. flava** (yellow), *R. Br. Prod.* 361; *Benth. Fl. Austr.* vi. 29. An erect shrub, with opposite or forked usually virgate branches, slightly silky-hairy or nearly glabrous, the whole plant often turning blue-green in drying. Leaves opposite, obovate oblong or almost orbicular, flat, more or less coriaceous, glabrous, prominently 1-nerved or rarely showing also the lateral veins, mostly 2 to 4 lines but sometimes nearly  $\frac{1}{2}$  in. long. Flower-heads terminal, with 4 involucre bracts, larger and broader than the stem leaves, either rather longer or shorter than the flowers. Flowers white or yellowish, diœcious. Male perianth-tube about  $1\frac{1}{2}$  lines long, the lobes about half as long. Filaments short; anthers with a narrow connective and the cells very distinct, but often somewhat turned inwards. Female perianth about  $1\frac{1}{2}$  lines long when in flower, 2 lines when in fruit, divided to the ovary into 4 very small rounded lobes.—Meissn. in *DC. Prod.* xiv. 510; Hook. f. *Fl. Tasm.* i. 333; *Calyplostegia flava*, *Endl. Gen. Pl. Suppl.* iv. part 2, 61.

Hab.: Mount Mistake.

17. **P. Bowmanni** (after E. Bowman), *F. v. M.*; *Benth. Fl. Austr.* vi. 30. An erect shrub, softly silky-hairy all over. Leaves alternate, crowded, sessile, oblong-lanceolate, 1-nerved,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, silky on both sides. Flowers solitary in the upper axils. Perianth-tubes rather slender, shortly and equally silky-villous, about 2 lines long, circumsciss above the ovary after flowering, the lobes more than half as long. Anthers in some specimens all abortive, in others with longer perianth-lobes, they are oblong, with a broad dorsal connective, the cells parallel on the inner face but more prominent and distinct than in most *Epallages*.

Hab.: Broadsound, E. Bowman.

18. **P. penicillaris** (like a painter's pencil, the hairs of flowers), *F. v. M. Chem. and Drug.*, Oct. 1883. A shrub clothed all over with silvery silky-hairs. Leaves sessile crowded, ovate-lanceolate, alternate or nearly opposite, flat. Involucre bracts 8, broadly cordate, silky on both sides. Flowers diœcious in dense heads. Calyx-rather small with long silky hairs. Style glabrous. Ovary silky towards the summit. Male flowers and fruit unknown.

Hab.: Inland towards the border of N. S. Wales.

19. **P. curviflora** (flowers curved), *R. Br. Prod.* 362; *Benth. Fl. Austr.* vi. 31. A shrub or undershrub much branched especially near the base, with wiry ascending or erect branches, attaining 1 to 2 ft., more or less silky-hairy. Leaves alternate or here and there opposite, varying in breadth, rarely  $\frac{1}{2}$  in. long and often not  $\frac{1}{4}$  in., glabrous above, sprinkled or clothed with appressed hairs underneath. Flowers small, hermaphrodite or female, in little heads really terminal but mostly appearing axillary from the shortness of the flowering branches, the involucre bracts few, usually 2 only, small and unequal. Perianth silky-hairy, the tube slender, usually curved below the middle, 2 to  $2\frac{1}{2}$  lines long, circumsciss about the middle after flowering, the upper portion falling off very early, leaving the style shortly protruding from the persistent base, the lobes not above half as long as the tube, the two inner ones sometimes smaller than the outer ones. Filaments very short; anthers with a very broad convex dorsal connective, the cells closely parallel on the inner face. Fruiting base of the perianth somewhat curved and contracted into a neck, the fruit itself shortly acuminate; epicarp membranous, endocarp not conspicuously hooked at the top. Seed apparently with a scanty albumen and broad cotyledons, but not seen very perfect.—Meissn. in *DC. Prod.* xiv. 512; Rudge in *Trans. Linn. Soc.* x. 285, t. 13; *Calyplostegia curviflora*, C. A. Mey. in *Bull. Acad. Petrop.* iv. (1845) 74; *P. gracilis*, *R. Br. Prod.* 362; Meissn. in *DC. Prod.* xiv. 512; Hook. f. *Fl. Tasm.*



i. 331; *Calypstrosteigia gracilis*, Endl. Gen. Suppl. iv. part 2, 61; *P. congesta*, A. Cunn. Herb. non R. Cunn.; *P. thymifolia*, Presl. Bot. Bem. 107; *P. Muelleri*, Meissn. in Linnæa, xxvi. 351, and in DC. Prod. xiv. 512.

Hab.: Southern Downs country.

Var. *sericea*. More silky, the leaves often hairy on both sides. Flowers sometimes rather larger, sometimes rather smaller and all female on some specimens both of this and the following variety. *P. propinqua*, A. Cunn., Meissn. in DC. Prod. xiv. 512.—Stanthorpe.

Var. *pedunculata*. More luxuriant, the leaves often  $\frac{1}{2}$  to 1 in. long. Flower-heads sometimes almost sessile in the axils as in the typical forms, but often on slender lateral or axillary peduncles (or flowering branches)  $\frac{1}{2}$  to 1 in., flowers rather larger.—Warwick, *Beckler*; Darling Downs, *Law*; to border of N. S. Wales.

20. **P. altior** (taller), *F. v. M. Fragm.* i. 84; *Benth. Fl. Austr.* vi. 32. A much-branched spreading shrub, attaining 5 or 6 ft., hirsute with short spreading hairs. Leaves opposite, shortly petiolate, from broadly ovate or orbicular and under  $\frac{1}{2}$  in. long, to oblong elliptical and  $1\frac{1}{2}$  to 3 in. long, flat, shortly hirsute on both sides. Flower-heads terminal or in the forks, with 2 to 4 involueral bracts similar to the stem-leaves but deciduous. Flowers not numerous. Perianth hirsute with more or less spreading hairs, the tube slender, about 3 lines long, circumsciss after flowering shortly above the ovary, the lobes about 1 line long. Filaments very short; anthers large, oblong, with a broad dorsal connective, the cells closely parallel on the inner face. Fruit about 2 lines long, the epicarp thinly membranous. Seed with a scanty albumen and ovate cotyledons.

Hab.: Brisbane River. Moreton Bay, *F. v. Mueller*; Archer's Creek, *Leic. hardt.* Common on the borders of southern scrubs.

## 2. WICKSTRÆMIA, Endl.

(After Im. Wickström.)

Perianth tubular, with a spreading 4-lobed limb without scales in the throat. Stamens 8, the anthers sessile, those opposite the perianth-lobes inserted in the throat, the alternate ones in the tube. Hypogynous scales 4, free or more or less united in pairs. Ovary with one pendulous ovule; style very short. Fruit a berry-like drupe, the epicarp succulent sometimes thin, the endocarp coriaceous or crustaceous. Seed without albumen.—Shrubs or trees. Leaves opposite or rarely here and there alternate. Flowers in short terminal or axillary racemes spikes or heads, without involueral bracts.

The genus extends over a great part of tropical Asia and the islands of the Archipelago and the Pacific. The only Australian species has a wide range over the area of the genus.

1. **W. indica** (of India), *C. A. Mey. in Bull. Acad. Sc. Petersb.* i. (1843) 357; *Benth. Fl. Austr.* vi. 37. A shrub, sometimes low and spreading, sometimes almost arborescent, glabrous or the slender branches slightly silky-hairy. Leaves from ovate and obtuse to ovate-lanceolate and acute or oblong-lanceolate and tapering at both ends, rarely above 2 in. long and sometimes all under 1 in., usually rather thin and glabrous. Flowers few together, very shortly pedicellate in small terminal heads sometimes growing out into short spikes, the common peduncle usually under 4 lines long, erect or slightly recurved. Perianth of a greenish yellow, glabrous or sprinkled with a few hairs, the tube scarcely 3 lines long, the lobes about 1 line. Hypogynous scales 4, small and narrow, approximate in opposite pairs and sometimes the two connate at the base. Drupe red, oval, about  $\frac{1}{4}$  in. long, the endocarp rather hard.—Meissn. in DC. Prod. xiv. 543; *Daphne indica*, Linn. Sp. Pl. i. 511; *R. Br. Prod.* 362; *Hook. and Arn. Bot. Beech. t.* 15; *F. v. M. Fragm.* vii. 1; *W. fetida*, A. Grey. in Seem. Journ. Bot. iii. 302; *Seem. Fl. Vit.* 207; *W. Shuttleworthii*, Meissn. in Denkschr. Regensb.

Bot. Ges. iii. 287; *W. Shuttleworthiana*, Meissn. in DC. Prod. xiv. 544; *W. viridiflora*, Meissn. in Denkschr. Regensb. Bot. Ges. iii. 286 and in DC. Prod. xiv. 546; Benth. Fl. Hongk. 297.

Hab.: Shoal Bay Passage, *R. Brown*; Port Denison, *Fitzalan*; Edgecombe and Rockingham Bays, *Dallachy*; Rockhampton, *Thozet*; Logan River, *A. Cunningham*, *Frazer*; Burnett and Brisbane Rivers, *F. v. Mueller*. Not uncommon.

Wood of a yellowish colour, soft and close-grained.—*Bailey's Cat. Ql. Woods*. No. 351a.

Reported as poisonous to stock.

The species appears to be also in the Indian Archipelago, in S. China, Sikkim, and the islands of the N. and S. Pacific. It is, however, not always easy to determine the limits to be assigned to it. The character derived from the perfect freedom or the union in pairs of the hypogynous scales appears to be of little or no value.—*Benth*.

### 3. PHALERIA, Jack.

(From *phaleros*, shining white; flowers.)

(*Drymispermum*, *Reinw.*; *Leucosmia*, *Benth*.)

Perianth tubular, with a spreading 4-lobed rarely 5 or 6-lobed limb, without scales in the throat. Stamens twice as many as the perianth-lobes, in 2 rows, those opposite the lobes inserted in the throat, the alternate ones in the tube. Hypogynous scales united in a short sinuate or lobed cup. Ovary 2-celled, with 1 pendulous ovule in each cell; style terminal, elongated. Fruit a drupe, with a succulent epicarp, the endocarp coriaceous or hard, 2 celled or 1 celled by abortion. Seed one in each cell without albumen, cotyledons thick and hemispherical.—Shrubs or trees. Leaves opposite, petiolate, larger than in most *Thymelea*. Flowers white or yellowish, several together in lateral or terminal sessile or pedunculate heads, surrounded by an involucre of about 4 bracts much shorter than the perianth-tube. Perianth longer than in most *Thymelea*, white or yellowish. Stamens usually as long as or longer than the perianth-lobes, but variable in this respect in different individuals of the same species.

The genus is dispersed over the Eastern Archipelago, Southern Asia, and the islands of the North and South Pacific. The species are difficult to discriminate, especially from the few specimens in herbaria. Jack's name, published in the Malayan Miscellany, has six years' precedence over Reinwardt's.—*Benth*.

Flower-heads terminal. Perianth-tube glabrous, 5-6 lines long . . . . . 1. *P. Blumei*.

Flower-heads terminal. Perianth-tube loosely pubescent, 7-8 lines long . . . . . 2. *P. Neumannii*.

Flower-heads mostly axillary or lateral. Perianth-tube glabrous, 1½-1½ in.

long . . . . . 3. *P. clerodendron*.

1. **P. Blumei** (after C. Blume), *Benth. var. latifolia*, *Fl. Austr.* vi. 38. A bushy glabrous shrub. Leaves oblong-elliptical or oval-oblong, shortly acuminate, more or less contracted at the base but the petiole distinct, mostly about 6 in. long and 2 broad, but varying from 4 to 8 in. and broader or narrower in proportion. Flower-heads mostly terminal, on a very short common peduncle. Involucre bracts 4 to 6, oblong or obovate, obtuse, about 3 to 4 lines long. Flowers usually numerous. Perianth-tube glabrous, 5 to 6 lines long, the lobes obtuse, pubescent inside especially towards the end, usually 4 but varying occasionally to 5 or even 6. Drupe shortly acuminate, when 2 celled 4 or 5 lines in diameter and furrowed outside opposite the partition, when 1-celled more ovoid and acuminate; epicarp succulent but not very thick; endocarp coriaceous.—*Drymispermum Blumei*, Dene.; Meissn. in DC. Prod. xiv. 604.

Hab.: Cape York, *M'Gillivray*, *W. Hill*, *Daemel*.—Also in Java and Sumatra.

There is great confusion between this and *P. (Drymispermum) laurifolia*, Dene., although distinctly characterised by Decaisne, Meissner and Miquel as having the perianth glabrous outside in the one, pubescent in the other. The Hookerian herbarium has two specimens, cultivated at different times in the Kew Gardens. The one figured in *Bot. Mag. t. 5787* as *P. laurifolia*, has the perianth glabrous, and would therefore belong to *P. Blumei*, whilst the

description refers rather to the other specimen with pubescent perianths which appears to be the same as the Javanese *D. longifolium*, Teysm., and is perhaps also identical with Decaisne's Timor *P. laurifolia*. The Australian specimens have the leaves rather broader and less tapering than is usual in the Javanese specimens of either species.—*Benth.*

2. **P. Neumannii** (after L. Neumann), *F. v. M.*; *Benth. Fl. Austr.* vi. 38. A bushy shrub, glabrous except the flowers. Leaves oblong-elliptical, shortly acuminate, tapering below the middle, much narrowed at the base and narrowly decurrent along the short petiole, 4 to 8 in. long,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. broad. Flower-heads terminal, sessile or nearly so. Involucral bracts 4 to 6, rather broad, obtuse. Flowers numerous in the head. Perianth hoary-pubescent outside, the tube 7 to 8 lines long; lobes usually 5 but sometimes 4 only, about 2 lines long, obtuse. Fruit rather larger than in *P. Blumei* and more frequently 1-seeded by abortion.—*Drymispermum Neumannii*, *F. v. M. Fragm.* v. 26.

Hab.: Rockingham Bay and Herbert River, *Dallachy*.

Probably not distinct from the true *P. laurifolia* from Timor, of which, however, I have seen no specimen for comparison.—*Benth.*

3. **P. clerodendron** (like a *Clerodendron*), *F. v. M.*; *Benth. Fl. Austr.* vi. 38. An arborescent shrub, scarcely 12 ft. high, quite glabrous. Leaves elliptical-oblong, much acuminate, tapering at the base but distinctly petiolate, 6 to 8 in. long. Flower-heads axillary or lateral, nearly sessile. Perianth glabrous outside, the tube  $1\frac{1}{4}$  to  $1\frac{1}{2}$  in. long, the lobes usually slightly pubescent inside, about 3 lines long. Involucre and fruits not seen.—*Drymispermum clerodendron*, *F. v. M. Fragm.* vii. 1.

Hab.: Rockingham Bay, *Dallachy*.

This species comes very near to *D. Cumingii*, Meisn., from the Philippine Islands, but the flowers are still larger.—*Benth.*

## ORDER CXIII. ELÆAGNACEÆ.

Flowers hermaphrodite or diœcious. Perianth tubular, free but persistent at the base and contracted above the ovary, the upper portion deciduous, 2 or 4-lobed, or in male flowers the perianth divided to the base. Stamens equal to and alternate with the perianth-lobes or twice as many, inserted at the mouth of the tube or at the base of the perianth; anthers versatile, with two parallel cells opening longitudinally. Ovary 1-celled, with 1 erect anatropous ovule. Fruit indehiscent, consisting of the persistent enlarged and usually succulent base of the perianth lined by the thin pericarp. Seed with a membranous or rather thick testa; albumen none or very thin; embryo straight, with a short inferior radicle.—Trees or shrubs, sometimes climbing, more or less covered with a scurfy or silvery indumentum consisting of stellate or peltate scales. Leaves alternate, entire. Flowers usually yellow or greenish, in axillary clusters cymes or short spikes, with 1 bract often very deciduous under each flower.

A small Order, chiefly Asiatic and European, with a very few American, northern, or tropical species; the only Australian genus has nearly the same area as the Order.

### 1. ELÆAGNUS, Linn.

(A classical name of the Wild Olive, hence the English name "Oleaster" for the European species.)

Flowers hermaphrodite. Perianth 4-lobed. Stamens 4, inserted at the orifice of the tube. Style elongated, recurved at the top, with a lateral stigma.

This, the principal genus of the Order, has several Asiatic or European and one North American species; the only Australian species is one widely distributed over Ceylon, E. India, and the Eastern Archipelago.

1. **E. latifolia** (leaves broad), *Linn.*; *Schlecht. in DC. Prod.* xiv. 610, and in *Linnaea* xxx. 347; *Benth. Fl. Austr.* vi. 39. "Millai-millai," *Atherton, Roth.* A shrub sometimes climbing over the tallest trees, sometimes erect and middle-sized or with weak straggling stems, covered except the upper surface of the leaves with the scurfy scales of the Order. Leaves petiolate, ovate ovate-lanceolate or elliptical, usually acuminate but sometimes obtuse, 2 to 4 in. long or larger on barren branches. Flowers several together in axillary spikes or clusters often not exceeding the petioles, with the bracts all small and deciduous, but sometimes longer with 1 or 2 of the lower bracts leafy and persistent. Perianths shortly pedicellate, the lower persistent portion narrow at the time of flowering, scarcely above 1 line long, closed at the top round the style by a disk-like annular prominence, the free part of the tube much broader, ovoid-campanulate, about 2 lines long, slightly contracted at the top, the limb spreading to 3 or  $3\frac{1}{2}$  lines diameter. Filament very short. Ovary glabrous. Fruiting base of the perianth about  $\frac{3}{4}$  in. long, slightly furrowed when dry. Seed about  $\frac{1}{2}$  in. long.—*Wight, Ic. t.* 1856.

Hab.: Rockingham Bay, *Dallachy*; Pioneer River, *Fernet*; also Eumundi, North Coast Railway Line, *Bailey and Simmonds*.

Wood of a yellow colour.—*Bailey's Cat. Ql. Woods*, No. 352.

The species is common in Ceylon and in various parts of India and the Archipelago. In Australia the indumentum is either all silvery-white or more or less mixed with or covered by ferruginous scales. The stature is very variable, and the size of the flowers also in a less degree.

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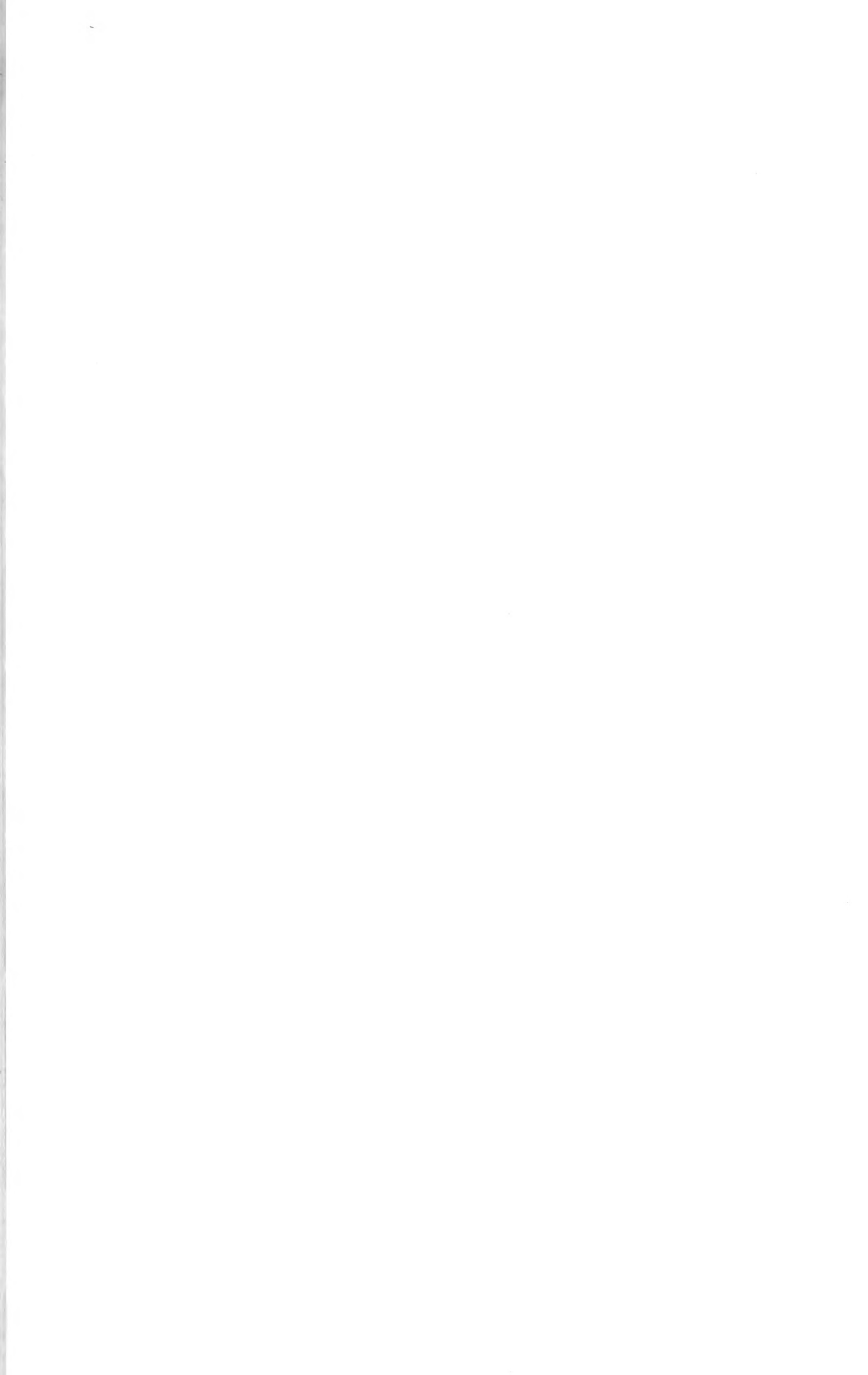
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